

## Infrastructure and Social Interaction: Situated Research Practices in Digital Humanities in India

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### Abstract

The computational tradition in India goes back to the two historic archival projects Project Madurai, a digitised collection of ancient Tamil classics and Bichitra, a digital variorum of Rabindranath Tagore's works which remarked the genesis of Digital Humanities in India. Subsequently, few public and private universities, non-academic organisations and individual scholars are actively involved in digital humanities projects: digital library, digital archive and digital databases. Though these digital establishments underpin Indian humanities scholars to engage in digital humanities research practices, the challenges in infrastructure impede them from leveraging the computational techniques and resources. In this paper, we will study the specific challenges of physical infrastructure such as digital humanities lab, digital humanities pedagogy, digital tools and software, and institution and government support. We will also discuss the brief survey report and few interviews which we conducted from the Indian DH community to reinforce our arguments.

### Introduction

In 2016, P.P. Sneha published a report "Mapping Digital Humanities in India." This is the first and foremost article that attempts to define Digital Humanities (DH) in Indian context and highlights some significant current DH projects. She records that DH is in "incipient stage" in India [Sneha 2016, 16]. However, the several key events in the recent past indicate that DH in India is steadily moving from an incipient stage to a "progressive stage." These events include the recent launch of Digital Humanities Alliance of India [DHAI 2018]<sup>[1]</sup>, the inaugural conference of DHAI<sup>[2]</sup> and introduction of DH courses and programmes<sup>[3]</sup>. The government schemes for public institutions such as Scheme for Promotion Academic and Research Collaboration [SPARC 2018], Impacting Research Innovation and Technology [IMPRINT 2015] and Impactful Policy Research in Social Sciences [IMPRESS 2019] include DH/DH related areas as a domain and subdomain. Besides these initiatives, we can also see the increase in the number of DH courses, conferences, workshops, and seminars<sup>[4]</sup> that are located in the India map (See Figure 1).

The map represents various DH activities of the few universities and colleges from the south, north, east and west parts of the country. The "blanks" in the map, reminds us that India is a geographically big country and houses to a large number of public and private institutions — and, by nature, DH requires sources such as funding and high-technology, that is not possible for small colleges and universities that have limited sources. However, this map illustrates the nascent stage of DH as an emerging discipline in India. Though the term DH has begun to be noticed in the academic circle in 2010 [Sneha 2016, 5], the computational tradition of humanities in India goes back two decades with two important archival projects such as Project Madurai [Project Madurai 1998] a digitised collection of ancient Tamil classics and Bichitra [Bichitra 2013], a digital variorum of Rabindranath Tagore's works which remarked the genesis of DH in India. Together with this, the recent mainstream attention of both central and state governments on "Digitize India" (<https://www.digitizeindia.gov.in/>) and "Digital India" (<https://www.digitalindia.gov.in/>) facilitate many large-scale investments in digitization, digital library, curation, and preservation. Digitize India, Delhi Archives and National Digital Library etc. are key projects of this digital establishment. One of the primary objectives of these projects is to make

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digital content available to the wider public, researchers and academics. These kinds of digital initiatives open up a new horizon in the landscape of humanities to engage in DH research practice by harnessing digital tools and techniques. Nevertheless, there has been little attention and investment in deploying these digital contents for advanced scholarly practice which entails robust infrastructure.

## Doings of Digital Humanities in India

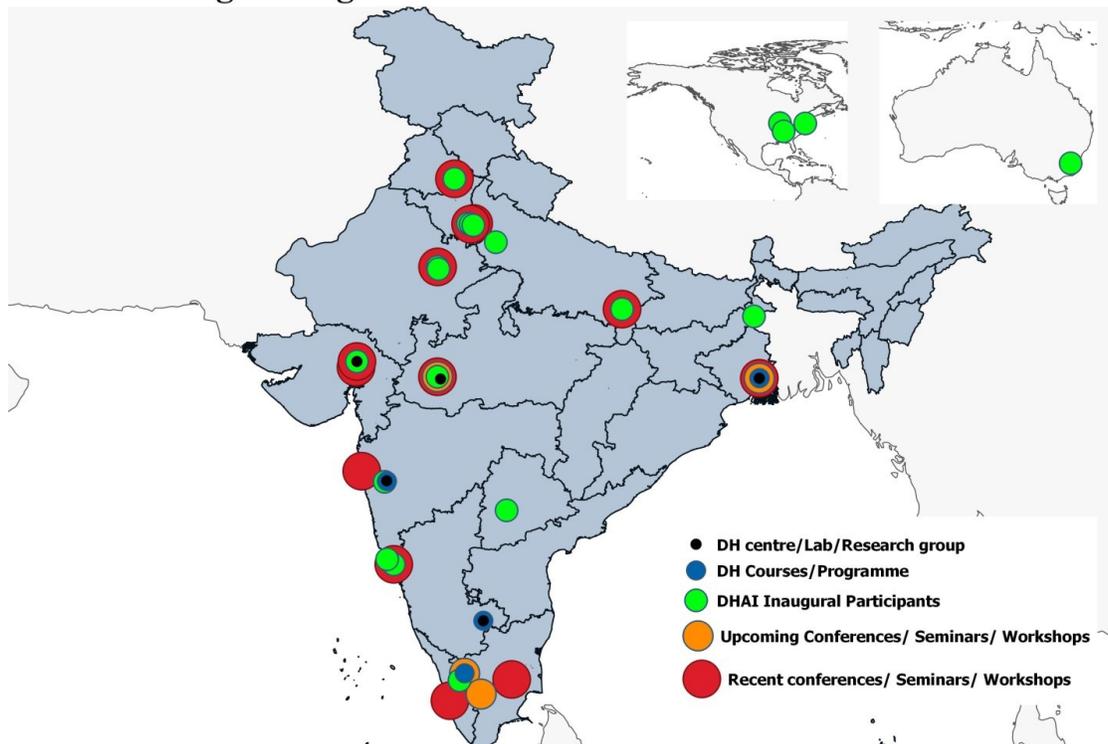


Figure 1. Map of DH activities in India

The lack of engagement in integrating humanities and digital lead to many challenges in infrastructure which impedes leveraging computational resources and techniques for DH research practice in India. Hence, the questions we ask: what are the specific challenges of infrastructure? and how do that affect DH research practice in India? We endeavor to answer these questions along with a case study which includes a brief survey and a few interviews<sup>[5]</sup> conducted for our paper from academic and non-academic organizations, and individual DH scholars respectively DHAI and CIS, DH group at IIT Gandhinagar and few individual scholars and faculties in various universities from different parts of India. For the survey, we shared our questions with 55 DH scholars and faculties from 25 academic institutions including public and private universities from different parts of the country. The responses were relatively low, and we have received 17 responses to the survey (See Appendix 1). This paper aims to detail both the challenges and opportunities of the institutionalization of the Indian DH community. In the following sections, we will examine the critical issues and challenges in infrastructure such as the lack of physical space, DH pedagogy, digital tools and software, institution and government and support which hinder DH research practice in India. We will also discuss the interviews and survey report to substantiate our arguments and finally, we will present the conclusion of this article.

## The Challenges in Infrastructure

What is infrastructure? Infrastructure provides more effective technical systems and services, for instance, from road to electricity, train, telephone and Internet and so on. The characteristics of infrastructure are to enable, facilitate, organize, support and manage any given system [Edwards et al., 2009] [Rockwell G 2012] [Blanke T;Kristel C;Romary L 2017]. Such infrastructure is the backbone of any organization. It is also apposite to the infrastructure of DH. Many scholars have been discussed the term infrastructure for DH (e.g. [Arms and Larsen 2007]; [Crane et al. 2009]; [Brown and Greengrass 2010]; [Svensson 2016]; [Edmond 2016]. There are few terms such as real infrastructure, research

infrastructure, academic infrastructure and cyberinfrastructure are used to refer to the necessities of DH structure. These terms employed to discuss various components which include from digital libraries to digital artefact, data organization, digital tools, publication, digital pedagogy, digital literacy, data management etc. In his book *Big Digital Imagining: a Meeting Place for the Humanities and the Digital Humanities*, Patrik Svensson discourses the various components of humanities and digital humanities infrastructure which he draws from his experience in various DH projects as a director of HUMlab Umeå University. He says,

It is not possible to imagine digital humanities — or any kind of humanities — without infrastructure. However, most of the humanities may not think of itself in terms of infrastructure, and the digital humanities must engage with infrastructure not just where doing so may come most naturally, such as language technology and archaeology, but wherever there is a need. Engagement is required not just in terms of building and using infrastructure but also in terms of conceptualizing and critiquing infrastructure. [Svensson 2016, 131]

His observation on the concept and critique of building the infrastructure for DH is applicable to the Indian context. In India, as we have seen in the introduction, the rise in the digital initiatives is an impetus for Indian DH scholars to engage in knowledge practices and take part in the global context. Nonetheless, the local exigencies of “conceptualizing and critiquing infrastructure” of humanities encumber digital research practices [Svensson 2016, 131]. For instance, if a scholar is interested in analyzing the data from the open-access archive through computational methods, he/she requires digital tools and software, training and finally a platform for publishing his/her outcome. Or if a scholar is interested in digitizing and archiving some historical document online, he/she requires a workspace (DH lab), computational skills, digital machine for scanning the documents, knowledge in organizing the data etc. In some cases, if DH scholar collaborates with a computer specialist for an archival project — he/she requires the basic knowledge of how the interfaces of digital intricacies work in the archive and how to maintain the archive for its sustainability. These paradigms demonstrate that “[i]nfrastructural systems are not and have never been one thing” and the multifaceted infrastructures are indispensable for a holistic approach to digital research practices [Svensson 2016, 133]. It also conveys how the material and non-material infrastructures shape the outcome and how the deficiency in one will affect the other one.

DH scholars, in general, should have facilities of various components such as DH lab, digital infrastructure, digital pedagogy, funding and institutional support. The below chart illustrates such kind of a global perceptive of components that build DH infrastructure which creates a conducive DH research environment for scholars (See Figure 2). In this paper, we will argue how the dearth of these facilities affects the establishment of DH in the Indian humanities spectrum.

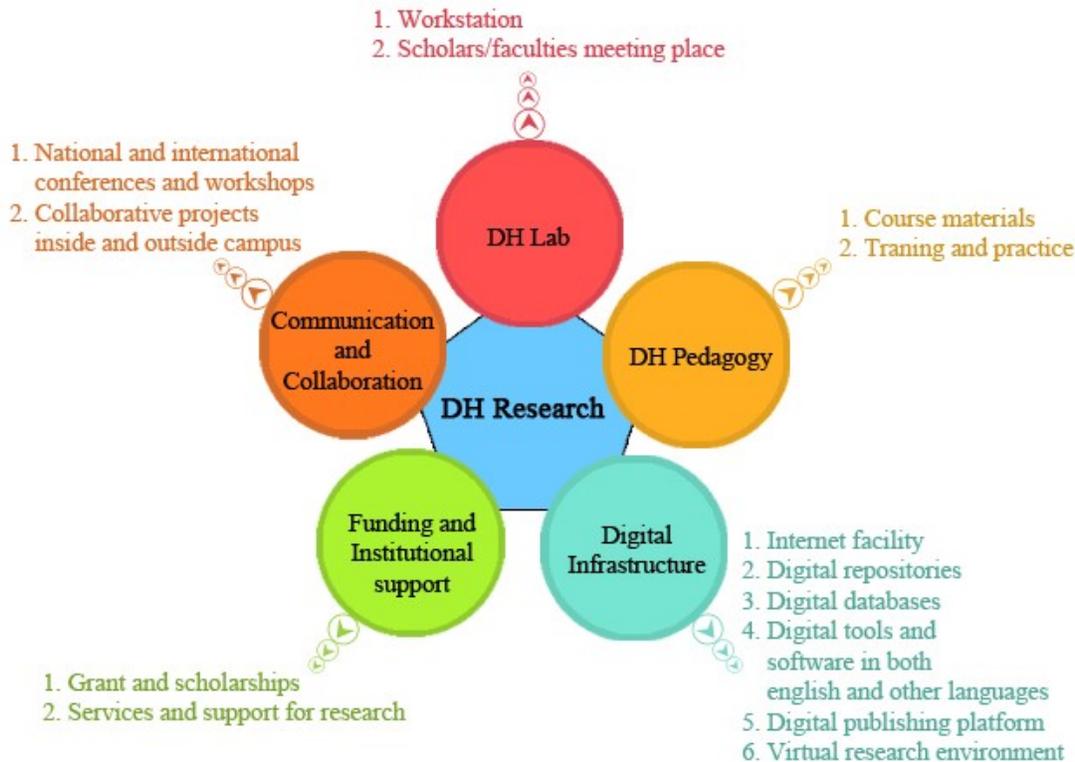


Figure 2. Components of DH infrastructure

## DH Lab

The nature of “laboratory” as a physical infrastructure of science that usually comprises of various resources of machines, devices, instruments, tools; several activities which include training, research, service; practices such as collaboration and team work-based; methods of experiment, prototyping and tinkering. DH labs “rely on the same general principles as laboratories in the sciences, including collaborative work, practice-based and tool-based research, and an emphasis on practicality and innovation” [Pawlicka 2017, 538]. DH lab hence is a place for heterogeneous activities as scholars deploy multiple technologies ranging from programming languages to 3D printing, photogrammetry, digital tools and software to create a new content or to find or to study text or map or archive or images and so on. Such kind of DH environment is minimal, or in other words, non-existent in many Indian universities. A few DH avenues such as Centre for Digital Humanities at Institute of Advanced Studies in English [CDH 2013], The Digital Humanities at Presidency University [Digital Humanities at Presidency 2011] and a few research groups such as Digital Humanities and Publishing Studies at Indian Institute of Technology (IIT) Indore [DHPSR 2018], Digital Humanities at Indian Institute of Technology (IIT) Gandhinagar [Digital Humanities 2018], Digital Humanities and Cultural Informatics at Jadavpur University [Digital Humanities and Cultural 2003] and Srishti Institute of Art, Design and Technology [Digital Humanities 2018-2019] to a certain extent are equipped with digital technologies such as high performing computing, access to various digital databases, workspaces, access to a few digital tools, software and machine, training etc. Unfortunately, other public institutions and universities, where we can locate some DH research practices of text mining, digital archive, GIS, Social Network Analysis and more, lack the basic infrastructures as the “existing institutional infrastructure is often inadequate, and mostly outdated” [Sneha 2016, 28].

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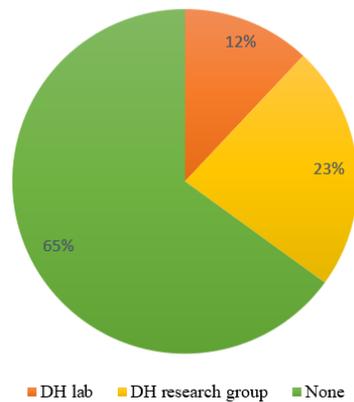
During our survey, some of the respondents mentioned about the lack of a physical space and bureaucracy constraints which inhibit their DH research:

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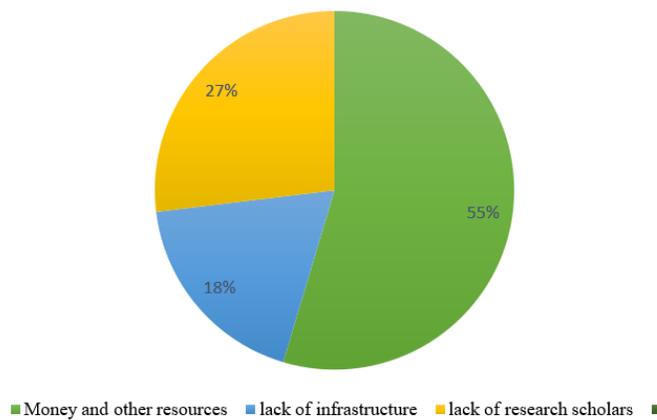
A physical space or a lab space is important. We need both human resources as well as softwares to sustain DH at our institutes. It is difficult to acquire a space and explain the space and its need to

people [T]here are a number of official formalities which one has to do for using a lab or to start some new works in the University

Nonetheless, there are a few scholars, who are interested in deploying digital technologies for their research, scattered in various state and public universities such as Jawaharlal Nehru University, Bharathiar University, St. Xavier's College, Victoria College etc. In these institutions, the absence of a number of DH scholars deters the development of the DH research group that would have led to push the bureaucracy in building their own DH space. Though these isolated individual scholars assimilate their computational skills and heuristics for their research through online resources, how do they collaborate or discuss their research with their peer groups? how do they access or use digital tools without much technical support and training? DH center and lab hence, "play key isolation reduction role by providing technology; expertise; information about tools, standards, and ongoing projects; as well as introductions to prominent figures in the digital humanities community who can serve as guides and mentors" [Alexander and Davis 2012, 373].



**Figure 3.** The responses to the question of if the participants have DH lab/research group or not



**Figure 4.** The responses to the question of the challenges in setting DH lab

We asked in our survey whether the participants have DH center/ lab/research group at their institutions. Very few responded that they have DH lab (12%) and research group (23%). Most of them (65%) wrote that they have neither lab/center nor research group (see Figure 3). Then, we asked about the challenges in building the DH space in their institutes. Not surprisingly, the majority of the participants (55%) responded that money and other resources (human and technological resources) are the primary challenges in setting up the DH environment in their institute. 27% respondents stated that the lack of research scholars and 18% said the lack of infrastructure (see Figure 4). Besides the dearth of money, infrastructure and research scholars, there are other overarching components such as the inadequacy

of DH programmes, courses and course materials, experts and training that prevent building DH center/lab in the public institutions. These human and non-human sources are fundamental to produce mass DH scholars who will later then develop DH centers, labs and DH scholarship by seeking institutions' support and funds.

## Digital Humanities Pedagogy

The few universities and colleges such as Jadavpur University, Koti Women's College, Srishti Institute of Arts and Design and Technology offer Post Graduate diploma, Bachelor and Master-level programmes in DH. Other pioneer institutions such as Presidency University, Bharathiar University, IIT Gandhinagar, IIT Delhi, FLAME University, Delhi University and Aligarh Muslim University offer courses on DH. DHPSR at IIT Indore is exploring "initating a dual MS (Research) + PhD programme in Digital Humanities which is still in the works and hopefully will commence soon" and IIT Jodhpur recently "has plunged headlong and instituted a full-fledged PhD programme in Digital Humanities" [Menon and Roy 2020, forthcoming]. These initiatives of premier institutions offer the hope for establishing DH in India.

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We conducted a survey of more than 50 public university programmes and their curricula for one of our upcoming essays [Menon and Shanmugapriya 2020, forthcoming]. We found that DH as a programme and course is few (which are from the above-mentioned institutions) but some cross programmes aligned with *Computer Science* such as History-Economics-Computer Application and History-Political Science-Computers Application etc. are more in number. Computer Application as an "appendix" of various disciplines implies that the investment in leveraging computer knowledge system for the disciplines of humanities to ensure the employment opportunities in the digital era and to meet the global demand. Given this discourse of humanities programmes, the "Vision 2020" report by the Planning Committee embraces the plan to deploy Information Technology (IT) to improve the sectors of "employment, education, infrastructure and governance" [Gupta 2002]. Subsequently, several other government initiatives such as National Mission in Education and Information and Communication Technologies (NMEICT), National Commission for Higher Education and Research (NCHER), National Programme on Technology Enhanced Learning (NPTEL) and National Knowledge Network (NKN) reinforce the access of higher education to the "last-mile" through the digital infrastructure such as distance education, video lectures, virtual academy and leveraging ICT for teaching and learning processes [Shah 2015]. As a consequence of these digital enterprises, Humanities and Social Sciences have experienced impressive growth over the past several years in terms of its integration with digital technologies for accessing, learning and teaching. For instance, NPTEL provides 38 online courses for Humanities and Social sciences which are taught by IIT professors [NPTEL 2014] Also, the digital repository and digital library respectively Shodhganga and National Digital Library (NDL) offer resources for the scholarly community through open access system. However, the humanities-based critical inquiry through deploying digital tools, software, methodologies and theories and incorporating learning goals which "focus on intermediate-to-advanced integration of methodologies-such as text encoding analysis and topic modeling, data visualization, and geospatial analysis" [Jakacki and Faull 2016, 359] and so on is absent in the curricula of the academic universities (except in few institutions as mentioned above). While there is an evidence of engagement with digital technologies for higher education and digital pedagogy, it is often unaware and unwilling to extend that in the critical realm of inquiry and investigation of humanities.

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Nevertheless, we had the opportunity to meet a few humanities faculties, during various workshops and conferences<sup>[6]</sup> pertained to DH, have manifested a particular interest in teaching digital tools and techniques to enrich the learning process and educate future DH scholars. It depicts the significant interest among the faculties and scholars towards DH in India. Nonetheless, DH faculties Saleem Mir at the Cluster Innovation Centre, University of Delhi and Sharmistha Chatterjee at the University of Calcutta and Arnapura Rath at IIT Gandhinagar bring our attention to the different problems such as logistic constraints, no academia training, insufficient course materials, fast changing digital tools, lack of access to digital tools and software, lack of teamwork and more.

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Mir: It was in 2013 that we, here at CIC, realised the importance of the field of DH. So one paper "An Introduction to DH" was introduced at UG level while a degree course "M.A. in Digital Humanities and Culture Studies" was proposed. This master's programme is already passed by the University of Delhi but due to logistic and infrastructural constraints this course has not yet materialised...Teaching DH has been a challenge for me as I don't have any formal

education/training in it. But students' response has been very encouraging and they like the practical part of the course where they are exposed to some open source softwares like voyant, QGIS, Gephi, Ngram and some other text analytics tools. The theoretical debates also generate a lot of interest amongst our students. But the problems that students as well as teachers face in the course are mainly related to the availability of course material and fast changing digital tools.

Chatterjee: In the absence of a properly planned module, its difficult for the students to grasp the basics of DH and how the study benefits research on Arts, Heritage and Culture. Having no infrastructure it becomes tough to demonstrate the softwares and their specific usages that restrict the study only to the theoretical level rather than practical applications. I believe every University and Department should have an introductory course on DH, if not a specific module...The other constraint is getting trained professionals in the team for planning and execution.

Rath: It is difficult for students to orient themselves to the digital studies as a new area of research. The other aspects is that when comes to technological support, for example the data visualization tools on mapping are not always accessible and also people are not completely aware of digital tools. We can guide students to identifying their research data and offer research ideas but when comes to realizing in the form of concrete project of website within the institute there might be a bit of a challenge in terms of handling these tools and data — we do check external support to host our projects.

What we can observe from their interviews is that the insufficient infrastructure, as mentioned above, precludes the application of digital tools and software for scholarly practice. As Mir mentions, students can learn some open source tools, which do not require much programming skills and apply for their work. But, in some cases such as the critical inquiry of the text through an algorithm or developing digital archive, they seek help from the external support as Rath mentioned above. However, this is not possible for all other state and central university faculties/scholars as they do not have the facilities of funding, services and support for their research from their departments and institutions.

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Another important concern is the lack of technical proficiency of current DH scholars who directly come from the traditional humanities. In the inaugural conference of DHAI, the panels presented diverse DH projects such as digital infrastructure, pedagogy, scholarly publishing, and archive etc. but just very few presentations on the digital tool and text mining. Does this mean that the current Indian DH scholars are disinterested in text mining? Nothing could be further from the truth, this comes not from disinterestedness but the lack of technical proficiency. These scholars come from traditional humanities with little education on computer applications but very much interested in employing digital technologies and heuristics for their innovative digital research. This gives “a little confidence or inclination to understand the impact of the digital on the ways in which their projects can be influenced, indeed cannot otherwise be imagined” [Menon and Shanmugapriya 2020, forthcoming].

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Furthermore, what is frustrating and exhausting for the current DH scholars and faculties are that they can find very rare platforms for learning digital tools and technologies for their research in country like India which “supplies millions of software engineers to the world” [Mukherjee 2008]. At the same time, not all humanities scholars and faculties have fund to attend winter and summer schools, workshops on DH which often occur in the west, for instance, DHSI (<http://www.dhsi.org/>) etc. In India, a few DH avenues conduct various workshops and winter school on digital tools. The DHPSR group at IIT Indore conducted one-week workshop on “Digital Humanities: Tools, Texts, Theories” in which R and some online tools such as Voyant were taught [GIAN Digital Humanities 2018]. Similarly, CDH Pune conducts winter school on DH every year since 2015 and in the recent workshop which provided training in using Omeka tool for content development [CDH 2013]. These platforms offer some opportunities to DH scholars and faculties to learn tools and methods for their research. Additionally, self-paced learning becomes very common in the digital era due to the open access system — some scholars, who are active on the Internet, learn many open DH resources of tools and techniques<sup>[7]</sup>. However, the knowledge in data management and data organization is also equally important as one participant wrote in the survey as “setting up a research method garnered to mining and categorising digital data has been a challenge.” Correspondingly, during our interviews, some scholars expressed the challenge of “know-how” of

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digital tools and software. Few scholars even end up giving their digital research practice after many attempts due to lack technical competency.

Research scholar Sagorika Singha at Jawaharlal Nehru University, Delhi:

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I realised the usefulness of network analysis tools and SM (Social Media) analytics while working on social media participation. While theoretical engagement and close readings were invariably important, dealing with large data-sets, such tools seemed invaluable. But unfortunately, because of the lack of know-how and this realisation coming in slightly late in the duration of the project, I could not do what I wanted to. But I am open to develop this later, whenever I find myself prepared.

Research Scholar Mohanapriya at Bhararhiar University, Coimbatore:

In my case, I had a bitter experience. I struggled more often to acquire this technical skill. Due to the lack of technical assistance I engaged more on YouTube channels and textbooks to learn text mining in Python. I got very few technical supports and very less contact with people who have some knowledge about this area of research. Lack of infrastructure and proper training in this programming language made me give up after facing many attempts.

To overcome this issue of data organization, data management and digital literacy, the curriculum of humanities students has to implement the DH pedagogy and training at graduation level which will give the confidence to the scholars to understand the intricacy behind digital technologies and data harvesting and to implement it in their research practices. Dibyadyuti Roy is one of the co-founders of DHARTI who tells us about the DHARTI's contribution on DH in India: "I would personally like to see the DH curriculum permeate not only into universities but schools and vocational institutes as well. Organizing free-to-attend workshops that allow DH to become accessible for all kinds of audiences would be one goal that I would see for DHARTI." As he says, such local initiatives of free-to-attend or nominal fee workshops, summer and winter schools will be helpful for the current research scholars to improve their technical proficiency. Notwithstanding, the inaccessibility and unavailability of digital tools and software are also significant obstacles that remain unaddressed.

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## Digital tools and software

DH conceives text as data — although the concept of data comes from "scientific fields such as mathematics, economics, biology, physics, and computer science... [, it] gained a central place in the humanities only with the migration of texts to the web" [Pawlicka 2017, 535]. Digital technologies have a crucial role to archive/analyze/map such kind of data/text in DH. However, for Indian DH scholars, many constraints from the local limit the possibilities of the desired outcome to archive or analyze the data. The deficit in digital technologies for Indian languages is one such limiting factor which affects digital research in Indian languages and literatures as Murray and Hand observe, "humanities work in Indic languages has been impeded by the lack of optimized [optimal] character recognition software" [Ray and Hand 2015, 142]. There are a few government initiatives such as Technology Development in Indian Languages [TDIL 2008] and Centre for Development of Advanced Computing [CDAC 2018]; both attempt to facilitate the basic digital technologies such as "[w]ord Processing, Presentation preparation, Spread Sheets preparation, Web Page Surfing & Designing, Messaging etc." in few Indian languages for public use and scholarly activity [About ILDC 2008]. Nevertheless, these digital technologies are inadequate for the DH scholars whose research focus on the works in Indian languages. Prashant Bhattacharji, in his article "Computer Science in India: A restricted student pool?", quotes Microsoft's CTO, Craig Mundie's remark on Indian Computer Engineers as "[they] are more into theory, [t]here is no local software and no new applications" in Indian languages [Bhattacharji P 2014]. As he says, the dearth of digital tools and software in Indian languages is a major limitation that is specific issue of the Global South [Bhattacharji P 2014]. The main issue stems from the disciplinary divide of humanities and computer science. Even though some traditional humanities scholars use digital archives and databases, they perceive employing computing for humanities research as more critical and pose epistemological skepticism in the concept of technology and text as data. Furthermore, the inadequacy of fund and the lack of institutional service and support thwart humanities scholar to have access to the payable digital technologies, and competence assistance for the existing free digital tools and software.

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## Institution and Government Support

Institutional support, such grants, scholarships, services and support for research, is a key factor to drive local DH research and training. Unfortunately, it is difficult and more challenging to obtain fund and support from the institutes for advancing humanities research in India. When the DH scholars require resources for their research which are similar to the science counterpart such a demand or request is viewed with skepticism by both bureaucracy and departmental administration. In traditional humanities, the idea of DH is still perceived with skepticism. Scholars such as Stanley Fish and Timothy Brennan have also argued that DH becomes applied cousin of foundational humanities [Fish 2012]; [Brennan 2017]. Administrations in most universities are not able to comprehend the seemingly contradictory term “Digital Humanities.” It is easier in autonomous institutions such as IITs and elite private universities than in state or central universities that are already constrained in funding resources. In 2009, Shreesh Chaudhary in an article, “India: Science and technology vs the humanities” points out the huge funding difference between science and technological institutions (STIs) and humanities and social sciences institutions (HSTs). He says that science and technology institutes are funded by ministries of science and technology, defence, IT and industry. They receive some US\$20 million a year for routine expenses, plus millions more from foreign agencies, non-government organizations, foreign governments and international bodies, as well as alumni donations for non-routine expenses [Chaudhary S 2009]. He says, “the HSTs receive only crumbs. ...While finance is not a problem for the STIs, it is a big problem for the others... The HSTs are starved of funds. They cannot provide even a minimal standard working environment for their academics and neither can they for their students.” [Chaudhary S 2009]. Similarly, in their article “Money for Nothing: The Disconcerting Future of the Humanities in India” published in 2018, Ishani Pant and Kirti Dass say, “At one end of the academic spectrum, science-related research endeavors are receiving funds galore; the situation is not quite as rosy at the other end. Humanities scholars in India are unable to catch a break. India is undergoing an academic crisis that threatens researchers of the humanities” [Pant and Dass 2018]. Though these articles were published at different period of time; they all emphasize the same issues that humanities and social sciences in India are “always already” in crisis. In a similar vein, the humanities in Anglo-American countries have been encountering crisis since 1980s in many ways such as budgetary cuts, corporatization model or profit model of education, falling enrollments, adjunct faculty system and so on [Bérubé and Nelson 1995] [Fish 2010] [Jay 2014]. The disproportionation in the funding between science and humanities seem common in many countries. Frank Donoghue points out the unequal outside funding for American colleges and universities as, “almost all of the federal resources [that] is dedicated to research in the sciences and engineering, the humanities has suffered everywhere” [Donoghue 2008, 126]. In Britain, if the humanists are unable to show their contribution to economic profitability — their fund will drop and the number of faculties and students also will decline [Nussbaum 2012, 127]. On the other hand, in India, the allocation of fund for humanities especially for research activities is meager when compared to science and technology institutes. Pant and Dass draw the disparity in the fund allocation to Indian Council of Social Science Research (ICSSR) from 2006 to 2010 — the total grant given to “ICSSR was only 2.3% of the amount provided to the Council of Scientific and Industrial Research (CSIR), Of the funds given to ICSSR, only 20% could be used for research purposes, while the rest of the amount was utilised for meeting administrative costs, highlighting the lack of seriousness given to these subjects” [Pant and Dass 2018].

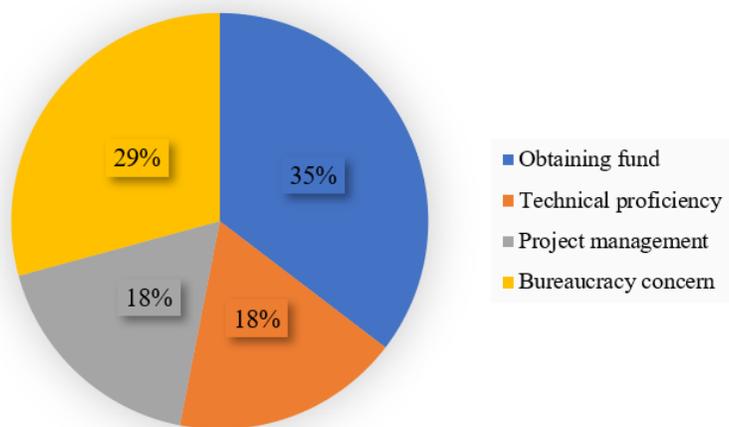
The disparity in fund for humanities suggests that there must be an “inherent issue” in the Indian educational system. The first universities in colonial India were established to focus on conducting exams and awarding degrees and they were not designed for research practices [Beteille 2010]. Despite the independence brought many changes in setting up various research-focused higher education institutions, “the universities have failed to free themselves from their older legacy of having to produce more and more graduates” [Beteille 2010]. On the other hand, Gangopadhyay discusses the “educational apartheid” which he refers to “the glorification of science” and “the devaluation of studies related to humanities” as studying science has many benefits such as “a slew of scholarships and grants right from high school levels” and he also points out the social pressure on good students to study science [Gangopadhyay 2012]. Therefore, the increase number of scholarships for studying science and the social pressure to choose science over the humanities thrust the mainstream fund for research into STEM fields.

Such disproportion fund and educational apartheid affect the institutional service and support in terms of both human and non-human sources for DH scholars. For instance, some institutions do not even have the basic facilities such as

Internet as one of the survey participants mentioned as “[w]e don’t have access to basic facilities regularly like the Internet and all.” Also, the completion of the project is not the end of the project — it is just the beginning for the users. For example, the scholars require institutes’ support to maintain some dynamic projects such as digital databases and archives which require human resources and digital tools to update, disseminate and maintain the longevity of the data. But these projects are neglected and conceived as a digital product which requires only a digital space in the institute’s web portal. Most of these projects have remained unprocessed and stagnant on the institute’s computer. For instance, Bhasa Bibliography the database project of DHPSR group at IIT Indore was completed collaboratively by DH scholars and computer science undergraduate students. This database will “offer access to scholarship in these [Indian] languages and literatures other than English” [Shanmugapriya et al. 2018, 86]. The humanities scholars have collected the first stage data for three Indian languages and the structure of the database was built with help computer science students. This project is going to be a crowdsourcer for keep updating the data from other Indian languages. We have another in-house collaborative project is Partition Archive — documenting the cultural artifacts and firsthand experience of partition migrants in Rajasthan. These small projects face some challenges in the form of who will maintain the database? How to secure funding for its sustainability?

At the same time, there are other substantial issues such as the inadequate knowledge in technical proficiency and lack of guidance prevent DH scholars to write project proposals which enable national and international collaboration. Lack of fund to attend international and national conferences and workshops obstruct developing contacts for collaborative projects. This absence of social interaction for DH scholars nationally and internationally precludes the establishment of DH in India. We also asked the survey participants to state the major challenges in collaborative projects, if any, within and outside their university. 47% respondents mentioned that they have collaborative projects. The significant challenges in collaboration are obtaining fund (35%) and bureaucracy concern (29%). Some participants responded that the lack of technical proficiency (18%) and project management (18%) deter the collaboration both inside and outside their campus (see Figure 5).

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**Figure 5.** The responses to the question of challenges in the collaboration

Nevertheless, we can note a few successful collaborative major projects such as the Scottish Cemetery Project (<http://scotscemeteryarchivekolkata.com/>) at Presidency University in collaboration with University of St. Andrews, Scotland, Two Centuries of Indian Print project (<https://www.bl.uk/projects/two-centuries-of-indian-print>) by British Library, the School of Cultural Texts and Records (SCTR) of Jadavpur University, Srishti Institute of Art, Design and Technology, and the Library at SOAS University of London, DIG\_IN: Digital Humanities Education Initiative Finland-India. Curriculum Development and Designing an e-Learning Module is a collaborative project of University of Helsinki, Aalto University, and Srishti Institute of Art, Design and Technology, and the recent project A Digital Narratology of Technology as Literary Actors and Artefacts of Settings in Indian English Novels at IIT Indore in collaboration with Lancaster University etc<sup>[8]</sup>.

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Besides these institutes level projects, the government grants schemes such as IMPRINT, IMPRESS and SPARC called for project proposals in DH. In 2016, IMPRINT identified DH as a domain for preserving heritage in the country such as languages, dialects, art forms, architectural structures, social and ethnic practices [IMPRINT 2015]; however, there is no data yet regarding the number of projects sanctioned through this scheme. The aim of the recent organization SPARC is to improve the research ecosystem of Indian higher educational institutions by enabling the collaborations between Indian institutions and the best institutions in the world. In their recent call for project proposals, DH is included under the category of “Emergent Areas of Impact” [SPARC 2018]. They approved 13 DH projects of the Indian institutes for funding and the projects are in collaboration with international institutes. Recently, the southern state government Kerala announced an upcoming digital university which will include a School of Digital Humanities<sup>[9]</sup>. These state and central government’s initiatives are important milestones in instituting DH in India.

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Similarly, the private organizations such as Centre for Internet Society [CIS 2008] and Sir Ratan Tata Trust<sup>[10]</sup> underpin DH initiatives in India. Sneha, programme manager of the researchers at work programme at the CIS, tells us that their direct engagement with DH in India has largely begun through the report of mapping DH published in 2016 and also their work on policy (accessibility, intellectual property rights, internet governance and so on) has informed the landscape of “internet studies” in India. As they also have been part of DHARTI, we asked her to share more about the contribution of CIS in the development of DH in India.

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Sneha: We have had the opportunity to engage with developing conversations and practices around DH, and related areas such as GLAM and digital pedagogies. Some examples include a project with the National Audio-Visual Cultural Archive (IGNCA) on IPR and digitization best practices, contribution to Indian and international publications and conversations with organisations (academic and others) on questions of access, infrastructures, language etc. We have been part of efforts in initiating and formalizing the Digital Humanities Alliance of India and continue to support its work in bringing together researchers and practitioners interested in DH, and in outlining areas for further collaboration.

All these key events and bodies hopefully demonstrate the optimistic vision of DH in India. Nonetheless, there has been the dearth of investment in humanities department from both government and institutions in terms of advancing local necessities and implementing innovative things such as assemblage of technologies, workspace, DH pedagogy and scholarship, scholarly publishing platform, grant to attend conferences and services and support for DH research. These significant deficiencies impede DH studies/research in Indian academic sphere. However, DH scholars in India typically resolve some of the problems such as DH methods and some technical assistance by seeking help from outside their campus. Also, they are eager to collaborate with other institutions to conduct DH workshop etc. as one of the participants stated below. For these scholars, “[n]ot all experiments succeed as originally imagined” but they recognize “the value of failure in the pursuit of innovation” [Spiro 2012, 29].

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[W]e have been seeking out people, workshop and conferences to widen our own knowledge base. Besides our faculty is supportive and curious about the research opportunities that DH can bring into our kind of work. We have been thinking about collaborations with outside institutions to organise workshop so that this can work as an introduction of what DH is.

## Conclusion

All of these above including our discussion, interviews and surveys with various stakeholders of DH in India lead us to some of the following conclusions. DH as an interdisciplinary field of research practice is *invisible/hidden* under the rubric of humanities but it continuous to be *visible/site* through the research practices and projects of these DH scholars and faculties in many private and public universities. The gradual increase in courses, conferences and workshops gives us a scope of DH in India as an emerging field and we can anticipate many interesting programmes and projects in future. That is good news. The bad news is that our university ecosystem and administrative mechanism are slow to respond to these intellectual and infrastructure challenges. It, therefore, behooves all of us who are invested in pushing the boundaries of research pedagogy and learning in the humanities to emphasize and facilitate the supporting role of

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DH within the larger rubric of humanities. Those efforts may open avenues for critical inquiry to continue to fulfill our mandate as humanities scholars and researchers in a democratic nation state.

## Acknowledgements

Survey questions:

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1. Do you have DH lab/DH center/research group at your institute? 1. DH lab 2. DH center 3. DH research group 4. Others (please specify)
2. What are some of the challenges of setting up the lab/center/group in your institute? 1. Money and other resources 2. Infrastructure 3. Lack of research scholars 4. Others (please specify)
3. What are the deficiencies of physical and virtual infrastructures at your institute that impede your research practices/projects/teaching?
4. Do you have collaborated projects with your colleagues inside university and/or outside university? 1. Yes 2. No
5. If yes, what are some of the challenges of collaboration? 1. Bureaucracy concern 2. Project management 3. Funding issues 4. Others (please specify)

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## Notes

[1] Digital Humanities Alliance of India (DHAI) has been renamed as Digital Humanities Alliance for Research and Teaching Innovations (DHARTI).

[2] The secretariat of DHARTI is hosted by Indian Institute of Technology (IIT) Indore and its inaugural conference was jointly organized by IIT Indore and Indian Institute of Management Indore. DHARTI recently conducted the Twitter Conference 2020 which received much attention from the national and international DH communities [DHARTI 2020].

[3] Major Research Projects (MRP) is a thrust area being developed the University Grant Commission (UGC) recognizes DH as one of the important areas that need emphasis and research support.

[4] For instance, IIT Gandhinagar offers two courses: Digital culture and new media and Introduction to Digital Humanities which have been offered from 2014 onwards. The latter one is a special topic course which is mainly for doctoral students who take DH as their research area. The recent conferences and workshops on DH as a main and sub theme were conducted in Banaras Hindu University, Varanasi, St. Xavier's College, Jaipur, St. Xavier's College, Mumbai etc. The upcoming conferences and seminars will be conducted in Bharathiar University, Coimbatore, Mother Teresa Women's University, Kodaikanal, University of Calcutta, Kolkata etc. For further details :

[http://people.iiti.ac.in/~dhiiti/index.php/2019/04/18/news/?preview\\_id=305&preview\\_nonce=8a9d25352f&post\\_format=standard&\\_thumbnail\\_id=-1&preview=true](http://people.iiti.ac.in/~dhiiti/index.php/2019/04/18/news/?preview_id=305&preview_nonce=8a9d25352f&post_format=standard&_thumbnail_id=-1&preview=true)

[5] The survey was conducted through online platform SurveyMonkey. We began it in 16 January and was open to the participants till 30 January 2019. The interviews were also collected in the same period mainly through telephone and emails.

[6] Digital Humanities in India Workshop, 11 and 12 April 2018 at New Delhi (<http://wp.lancs.ac.uk/dhindia/events-2/?fbclid=IwAR1I3wC2NmuaHmgLQAI2cHNbaHWjboLEZybv-vXbiC8b4rTZkQz3DTK6Hn8>) and DHAI Inaugural Conference, 1 and 2 June at IIM Indore.

[7] For instance, some research scholars use YouTube channels for learning programming languages such as R and Python etc. Also, they can access to some blogs of prominent DH scholar like Matthew Jockers who posted tutorials on text mining in R for literature students (<http://www.matthewjockers.net/materials/dh-2014-introduction-to-text-analysis-and-topic-modeling-with-r/>). DiRT (<https://dirtdirectory.org/>) provides information about the digital research tools for various DH research practice.

[8] SPARC sponsored collaborative projects: [https://sparc.iitkgp.ac.in/apProposal\\_list.php](https://sparc.iitkgp.ac.in/apProposal_list.php)

[9] <https://www.iitm.ac.in/iitm-k-upgraded-to-a-digital-university/>

[10] CIS is one of the sponsors of DHARTI conference. Similarly, Granth South Asia project [<http://granthsouthasia.in/>] is supported by Sir Ratan Tata Trust and it is a collaborative project of School of Cultural Texts and Records, Jadavpur University and British Library UK.

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