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# Chapter 3

## Aboriginal Digitalities: Indigenous Peoples and New Media

Armida de la Garza

1 **Abstract** This article goes beyond considerations of digital media sup-2  
porting identity and community to discuss the ways in which digital technology 3  
itself resembles and even parallels traditional indigenous means of producing and 4  
sharing knowledge and of experiencing time and space. Drawing from examples 5  
ranging from Aztec maps that represented time-space units simultaneously, through 6  
discussing indigenous codex and glyphs in which visual language is able to convey 7  
meaning using simultaneity rather than chronological narration, to the use of perfor-8  
mance for durable cultural storage and transmission, this article points to the many 9  
areas of convergence between the multimodal communication that digital media 10  
increasingly enable and ancestral practices of indigenous peoples around the world.

11 **Keywords** Indigenous studies · Digital media · Philosophy of space and time

### 12 Introduction

13 Most research on digital media and indigenous peoples tends to focus on the affor-  
14 dances these media provide to indigenous communities, allowing them to counter  
15 stereotypes while also providing “innovative contexts and practices through which  
16 new forms of indigenous solidarity, identity and community are created” (Grixti  
17 2011, 344). This is a growing field of research, which I briefly summarize below  
18 using examples from videogames, interactive documentary, new media art, and the  
19 use of Internet in everyday life, while also discussing the way that indigenous peoples’  
20 engagement with new media is expanding these media’s narrative, and sometimes  
21 technical, capabilities.

22 The second part of the chapter goes beyond these considerations, to focus on  
23 the ways in which digital technology itself resembles and even parallels traditional  
24 indigenous means of producing and sharing knowledge and of experiencing time  
25 and space. Drawing from various examples, this chapter points to the many areas

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26 of convergence between the multimodal communication that digital media increas-  
 27 ingly enable, and ancestral practices of indigenous peoples around the world. The  
 28 examples include: Aztec maps that represented time-space units simultaneously;  
 29 indigenous codex and glyphs in which visual language is able to convey meaning  
 30 using simultaneity rather than chronological narration; and the use of performance  
 31 for durable cultural storage and transmission, among others. The chapter concludes  
 32 by suggesting that this convergence will become the ground for multiple and fruitful  
 33 synergies.

## 34 **Digital Media and Indigenous Identity**

35 Video gaming and Aboriginal stories and storytelling techniques meet in AbTec, short  
 36 for Aboriginal Territories in Cyberspace, a foundation aimed at training Aboriginal  
 37 youth in new media production that reaffirms community and identity. Participants in  
 38 AbTec’s workshops have designed video games that take advantage of the repetition  
 39 structure of some Iroquois legends to build complex, multilevel gaming experiences  
 40 like The Otsi!. Its narrative centers on an Iroquois hunter that is on a mission to stop  
 41 the Flying Head, a monster terrorizing the territory where he lives. The game takes  
 42 players from the story of the Flying Head’s origin through to its confrontation with  
 43 the hunter. In each level, the player meets a creature from a different Kahnawake  
 44 legend: the Tree People, the Monkey Dog, and the Hoof Lady, among others, so that  
 45 the game also works as an immersive medium to learn about the legends. AbTec’s  
 46 founders, Mohawk artist Skawennati Fragnito and Jason Edward Lewis of Cherokee  
 47 ancestry contend the study of Aboriginal storytelling techniques is crucial, as this lays  
 48 the groundwork for embracing networked technology as potential sites of cultural  
 49 expression—and cultural expansion. In their words (Lewis 2014, 66):

50 It is important that participants learn that the storytelling techniques in their community lie  
 51 on a continuum with those of digital media, and that they do not lie on either side of some  
 52 insurmountable cultural or epistemological divide.

53 *Italics or inverted commas for these two names of games?*  
 54 Quoting the success of video games such as Braid and Passages, games that <sup>2</sup>  
 55 have unexpected approaches to time and teleology, Lewis further suggests that the  
 56 grammar for video games remains up for grabs, and we can still end up with tools  
 57 that are better able “to accommodate substantially new systems and structures for  
 58 computationally based approaches to communicating [Indigenous] stories” (Lewis  
 59 2014, 72). This is what, in a different context, Srinivasan (2006, 513) calls “mapping  
 60 a cultural discourse to an organization of databases” that serves the cultural needs of  
 61 Indigenous communities.

62 In the realm of film making, advantage is taken of the many traditional Indigenous  
 63 narrative structures in which simultaneity is a feature of characters and beings. Char-  
 64 acters are fluid and capable of transforming, and they are also capable of occupying  
 65 multiple states at once. (Foster 2014, 103) From this perspective, interactive digital  
 technologies with potential for layering, for simultaneous and multiple variations,

66 can take advantage of non-Western narrative forms, incorporating their strategies  
 67 into their structure and thus expanding what is traditionally understood as a mode or  
 68 genre. Indigenous film maker Steven Foster's interactive documentary *Prince George*  
 69 *Métis* is a vivid example of this. It shows the Elders discussing technology along with  
 70 indigenous traditions. Although it can be viewed by one single person on a computer  
 71 at a time, it really comes to life when played simultaneously on multiple screens  
 72 controlled by various members of the audience, thus challenging the individualized  
 73 authorship and linear structure of most documentaries.

74 In a similar vein, installations such as the one by Cree new media artist Archer  
 75 Pechawis also hybridize media forms and contents. In this case a traditional hand  
 76 drum is wired to a digital audio sampler, thus incorporating sound bites into tradi-  
 77 tional powwow songs that were meant to communicate with the dead. As put by  
 78 the artist, "the protocols that govern the ceremonial use of drums are as specific  
 79 as the protocols that govern traffic on the Internet" (Pechawis 2014, 41). Notably,  
 80 indigenous new media artists frequently use digital technology that is regarded as  
 81 futuristic to address the past, to put forward versions of history from indigenous per-  
 82 spectives. The exhibition suggestively entitled "If History Moves at the Speed of its  
 83 Weapons, then the Shape of the Arrow is Changing" (2010), featured graphic scores  
 84 representing the trajectory of each weapon used in the Great Southwest Rebellion  
 85 in 1680, when the tribes of what is today Santa Fe, New Mexico, resisted Spanish  
 86 colonialism. The artists used an algorithm to transform ballistic data of the revolt-  
 87 era weapons into sound, so that the spear-thrower became a square tone, the rock  
 88 and sling, a sawtooth tone and so on. The speed of each weapon was transformed  
 89 into the speed of the sound tone traveling through the air. Digital technology was  
 90 instrumental in both the analysis and modeling of the weapons, in that it allowed the  
 91 weapons as sound to be highly accurate renderings of the originals, and to have a  
 92 palpable impact: "the weapons' piercing tones were acutely heard and felt while the  
 93 armaments themselves remained unseen" (Hopkins 2014, 122).

94 Beyond the realm of digital art, the use of the Internet on a day to day basis  
 95 also provides evidence of the way digital technologies support indigenous identities  
 96 and cultures. Laurel Dyson's comprehensive overview of the use of the Internet by  
 97 indigenous communities identified some 350 million indigenous peoples living in 70  
 98 countries around the world, many of whom have some sort of online presence, and  
 99 notably with quite a few counted among the early adopters who first set up websites  
 100 in the late 1980s (cf. Dyson 2013). The Cherokee, Zapotec, Sami, Mapuche, Yoeme,  
 101 Wendat, Tonga and Maori are among the groups discussed by Dyson, who notes  
 102 as the main uses of the online presence the reaffirmation of indigenous identity, in  
 103 both in-reach and outreach modalities; reconnecting with the indigenous diaspora;  
 104 indigenous cyberactivism; and fostering language learning (Dyson 2013, 259–265).  
 105 To reaffirm their cultures, indigenous peoples use message boards and chat facilities  
 106 to transform the sites from purely information-providers into tools for communi-  
 107 cation, creating virtual spaces for shared meanings and providing information to  
 108 outsiders that includes even some e-commerce and the promotion of tourism, thus  
 109 realizing the potential of the Internet "to simultaneously generate income and [to  
 110 try to] control the outsider view of their identities" (Dyson 2013, 260). Further,

111 the Internet is credited with enabling forms of collective organization within and  
 112 between indigenous communities to raise issues such as land rights, rights to self-  
 113 determination, environmental issues and so on, creating pan-indigenous movements,  
 114 and organizations that would not have been possible before.

115 But if video games, interactive documentaries, artistic installations, and exhibi-  
 116 tions and the daily use of the Internet already show very fruitful interactions  
 117 between indigenous communities and new digital media, there is a much deeper  
 118 affinity between them that becomes evident when the forms of producing, storing,  
 119 disseminating, and transmitting knowledge are taken into account. This perspective  
 120 is rarely discussed, and it is to these elements of convergence that we now turn.

## 121 **Convergence Between Multimodal Communication** 122 **and Indigenous Epistemologies**

123 To begin with, the material basis of the digital network must be discussed. There is  
 124 an argument that it can in fact be traced back to the knowledge systems of the First  
 125 Nations of the world. In one account the story begins with hunter-gatherers exploring  
 126 the field for food and resources, including of course information on the terrain, other  
 127 tribes in the vicinity and so on. With time, the paths they followed became trade  
 128 routes, as they established networks and trade languages and built a knowledge base  
 129 around what they knew about each other. So,

130 When the first Europeans came to ‘explore’ the land, our ancestors naturally led them along  
 131 these well-established paths, which, over time [...] became roadways and thoroughfares.  
 132 With the advent of the telegraph and the telephone, wire was hung along these thoroughfares  
 133 that literally became the beginnings of the physical network that now allows more and more  
 134 packets of information to move as freely as our ancestors [did before] (L’Hirondelle 2014,  
 135 153).

136 Others have pointed to the practice of Potlatch common among North American  
 137 Indians, particularly in the Pacific Northwest coast of Canada and the United  
 138 States,<sup>1</sup> which proved fundamental to Marcel Mauss’s influential theorisation of  
 139 what he termed “the gift economy” (Mauss 1950 [2001]). Potlatch involves indige-  
 140 nous aristocrats competing for power and prestige by holding annual competitions  
 141 to redistribute their wealth among the people; or, if in winter, to destroy a larger  
 142 proportion of their goods in bonfires to warm the tribe, the winner being the one who  
 143 can part with the most goods. The status of a given family is raised not by having  
 144 the most resources, but by distributing the most resources. This behavior has been  
 145 compared to the altruism of hackers, open software developers, wiki editors, and  
 146 ‘answer persons’ in usernet groups (Berger 2012), and indeed to the whole digital  
 147 commons project, in which sharing is crucial.

<sup>1</sup>Comprising the Heiltsuk, Haida, Nuxalk, Tlingit, Makah, Tsimshian, Nuu-chah-nulth, Kwak-  
 waka’wakw and Coast Salish cultures. It must be stressed that the use of potlatch varied widely  
 among the different tribes.

148 *Visual Language, Indigenous Codex and Glyphs*

149 Apart from the material basis of the network and the behaviors it fosters, the content  
 150 itself is also often encoded using visual languages, which were crucial to indigenous  
 151 peoples. Digital media foreground the screen. Space, size, color, shape, and a variety  
 152 of icons comprise the new tools for communication. As recent research on color  
 153 has shown, it is increasingly entering even the previously monochrome world of  
 154 written text: the structure of texts in websites, magazines, and other media is now  
 155 signaled by means of layout, typography, and color. Color helps to segment text by  
 156 creating frames, provides salience, cohesion, and can signal genre, as when a text is  
 157 designed for children (Van Leeuwen 2011, 93). Color schemes have become a source  
 158 of meaning, more than individual colors.

159 Moreover, visual language is often perceived as instantaneous, perhaps on account  
 160 of its nonlinearity. Photography, for instance, is said to be moving away from being a  
 161 means of recording memories, to become more like spoken language, as photographs  
 162 are turning into “the new currency for social interaction” (Yamada Rice 2012, 162),  
 163 heightening the sense of immediacy. Especially among the young, more and more  
 164 images and less and less words are now exchanged by SMS. A hypothesis is even  
 165 being advanced that screen media are a better fit to globalized societies, since their  
 166 speed and reliance on the visual can easily overcome language and geographical  
 167 barriers. Moreover, modes of communication are no longer viewed only as repre-  
 168 sentations of phenomena in which each one brings specific affordances, but also as  
 169 tools that mediate thinking. It is useful to recall that as trans- and interdisciplinary  
 170 frameworks replace the old discipline-centered terms of reference to pursue research  
 171 in academia, it is figures like Leonardo Da Vinci who are becoming the new models.  
 172 Using mainly drawings and sketches as tools to think through, Da Vinci was able to  
 173 advance fields of knowledge that later became separated into ‘arts’ and ‘science’, but  
 174 which the most cutting-edge approaches today are once again seeking to bridge (Grey  
 175 and Malins 2004, 93). It can be argued that the capabilities for visual expression and  
 176 its attendant modes of thinking that the digital media are promoting is instrumental  
 177 in fostering these changes.

178 Visual languages in which color played a large part also constituted the main  
 179 means of expression in some indigenous societies. Before the arrival of the Spaniards  
 180 to what is today Central and South America, Indigenous people used pictorial and  
 181 iconic documents, the Codex (3.1), to preserve and transmit knowledge. Highly  
 182 flexible in nature, for they acted as templates on which either narrative content,  
 183 maps or mathematical operations could be recorded, Codex frequently employ visual  
 184 language to convey meaning using simultaneity rather than chronological narration.  
 185 The materials used were various dyes and pigments and deer leather or ‘amate’ paper,  
 186 folded into as many pages as necessary. Before the conquest, the painted books, or  
 187 Codex, could be divided into three broad categories: religious books and guides for  
 188 living, practical documents, and historical books. Nearly all Codex in the former  
 189 category, especially the ones related to prayers, songs, divination or dreams, were  
 190 destroyed during the Conquest. However some of the latter—around five hundred—

191 survived, and new genres were developed under Spanish rule, since the Spaniards  
 192 initially promoted them and the Indigenous people thought in mainly visual terms.  
 193 These were Catholic catechisms, legal suits and the Codex Tudela, an encyclopedia.  
 194 Indeed, it is said Catholic priests initially accepted only painted confessions, or, as  
 195 put by the priests, indigenous people were told “to bring their sins written down  
 196 in figures, because writing in figures is something they know and understand” (Hill  
 197 1998, 159). The way the grammar of the Codex changed before and after the Conquest  
 198 continues to be the subject of study today. Although language written in words was  
 199 originally absent from the pre-conquest Codex, several of the surviving Codex were  
 200 later annotated. In 2003 when CD-ROMs were still widespread, it was noted that  
 201 they shared some similarities with Codex: both aimed to store, preserve, transmit,  
 202 and disseminate knowledge with a mainly iconic, pictorial, and oral language, and  
 203 both allow different entrance paths, nonlinear, determined by the user (Leon Portilla  
 204 2003).

205 The Mendoza Codex (c. 1541)<sup>2</sup> for instance, post-conquest, contains a history of  
 206 Aztec rulers and their conquests along with a description of daily life. Each plant icon  
 207 represents a place, each human figure a ruler, and other icons depict tributes and dates.  
 208 Perhaps on account of its perceived kinship with digital media, the Mendoza Codex  
 209 has recently been digitized, taking advantage of the zooming functions and hypertext  
 210 to further its study. The digital version is open to users’ annotations, sharing, and  
 211 discussions, and it is also being hailed as a means to ‘virtually repatriate’ the Codex,  
 212 which has been located at the Bodleian Library at Oxford University since 1659.  
 213 On the other hand, the Codex of the Mixtec, from the region of Oaxaca in Mexico,  
 214 tended to depict a series of events in narratives that could move around easily in time  
 215 and space, as they relied on signs that changed when protagonists, places or dates  
 216 changed. In other words, it was the sequence of events that provided the backbone  
 217 of the story, not the place nor the time. This approach to storytelling has been called  
 218 the ‘res gestae’ (Hill 1998, 243) as it is an event-oriented way of narrating, quite  
 219 different from the linear narration.

220 Maps were another genre of Codex. But in contrast with medieval Western maps,  
 221 which rendered space as a continuous and given surface, and as an expanse to be  
 222 traveled across, Aztec Codex for maps represented time-space units simultaneously,  
 223 as ‘place-moments,’ enabling the perception of space as a meeting point of histories,  
 224 as processes not frozen in time (Massey 2008, 5–7). This is exactly the perception of  
 225 space that GIS mapping and GIS-based applications that rely on satellites now enable:  
 226 space as a meeting point of histories that can be discovered, a stock that in fact keeps  
 227 growing with users’ additions. The map-based history of the Aztecs systematically  
 228 arranged places on the painting surface with respect to their geographic location,  
 229 attaching in this way the events to the places where they happened (Fig. 3.1).

230 Many of the cartographic Codex combined this tableau with a single line of  
 231 events leading to the map, as a tour. This arrangement is exactly what features like  
 232 storytelling with Google Maps allow users to do today. Further, in her account of the

<sup>2</sup>An app can be downloaded at <http://www.codicemendoza.inah.gob.mx>, accessed 8 November 2015.



**Fig. 3.1** Tloltzin map, featuring the arrival of the Chichimecas, early sixteenth century, pictorial, and iconic. Courtesy of Dorothy Sloan Rare Books, Austin, Texas, USA

233 origins of modern cartography, Karen O'Rourke has remarked upon the fact that it  
 234 developed out of the rectilinear marking out of itineraries in antiquity, adding that  
 235 the Aztec maps of the period, which show "footprints and sketches [of] each day's  
 236 meals, battles and river crossings,' working as much as history books as geographical  
 237 maps, are strikingly similar to the itinerary maps that computers generate these days"  
 238 (O'Rourke 2013, xix). Locating the origin of the footprints and deciphering the icons  
 239 for the various places as registered on the itineraries allows for the maps to be read.

## 240 *Epistemological Convergence*

241 Although the visual language employed by the Codex is long lasting in relation  
 242 to oral speech, and can be read by anyone who shares the code, both of which are  
 243 features of writing, it was not considered as such. It is only alphabetic writing that has  
 244 long been recognized as writing proper; and further, credited with allowing scientific  
 245 knowledge to emerge. The argument states that so-called oral cultures transmitted  
 246 culture predominantly through face-to-face interaction, and therefore had a more  
 247 pragmatic approach to language, with knowledge not related to maintaining tradition  
 248 quickly discarded. A large body of knowledge could thus not emerge. Alphabetic



249 writing on the other hand allowed the objectification of culture, and this created the  
 250 conditions for its critique and the hierarchies of knowledge which eventually resulted  
 251 in science being granted the status of truth (Goody 1968). Under this paradigm,  
 252 indigenous knowledge was long awarded the status of belief or worse, superstition.

253 However, the present turn away from the written word and into the visual image,  
 254 another site of convergence, and the raising awareness of alternative systems of writ-  
 255 ing that have long prevailed in the East, such as ideograms, have increasingly put  
 256 these views into question. The positivist paradigm that reigned unchallenged in sci-  
 257 ence for the past 300 years is giving way to views that take uncertainty and chance  
 258 into account, such as chaos and complexity theory. In particular, the advent of West-  
 259 ern science's awareness of quantum mechanics has resulted in scientists, physicists,  
 260 philosophers, and academics coming to terms with views long held by indigenous  
 261 peoples; or, as Cheryl L'Hirondelle puts it, "increasingly meeting with the Elders and  
 262 indigenous thinkers." The Western world is finally coming to understand "how our  
 263 [indigenous] ancestors embedded and encoded [...] ceremonies, languages, world-  
 264 views, and metanarratives as complex algorithms that refer back to the very creation  
 265 of the universe" (L'Hirondelle 2014, 170). In this regard, the latest discoveries in  
 266 physics, such as the Higgs boson particle and the superstring theory would seem to  
 267 scientifically validate knowledge that indigenous peoples have long taken for granted.  
 268 The Higgs boson particle, sometimes dubbed 'the God particle,' accounts theoret-  
 269 ically for the conversion of mass to energy and vice versa. The Superstring theory  
 270 postulates ten dimensions—that is, an extra six to the readily observable dimen-  
 271 sions of length, width, depth, and duration. Both these theories provide examples  
 272 of convergence between the scientific knowledge that makes digital media possible  
 273 and indigenous knowledge, as indigenous languages sometimes included words for  
 274 concepts similar to these. Leroy Littlebear, former Director of the American Indian  
 275 Program at Harvard University and Professor Emeritus of Native Studies at the Uni-  
 276 versity of Lethbridge, puts it thus (quoted in Pechawis 2014, 43):

277 English, because of its structure, can't explain certain things, [and] therefore [has] a reliance  
 278 on a foreign language, [mathematics, which] does not happen in Navajo. In other words the  
 279 language is rich enough that it can explain those seeming paradoxes. That's where I see the  
 280 collaboration taking place, that's where I see partnerships occurring in science.

## 281 *Haptic Codes and Hyperlinks*

282 In his seminal study of the way that communication technology affects cognitive  
 283 organization, McLuhan (1962) famously hailed the advent of electronic culture as a  
 284 means of liberation from four hundred years of print culture, which he later defined  
 285 as modern, national, characterized by mass production of writing, the dominance of  
 286 perspectival images, scientific methods of observation and seeking linear chains of  
 287 causation. Importantly, he argued, print culture, with its focus on the eye, had brought  
 288 about sensory alienation. Electronic culture would instead bring about conditions of  
 289 sensory plenitude, stimulating the haptic and the tactile, and focusing on simultaneity



**Fig. 3.2** An Inca Khipu, a knot-based record-keeping mobile device seemingly based on binary code. With kind permission by Prof. Gary Urton, Harvard University

290 and indivisibility. It is undeniable that the digital age is foregrounding the body and  
 291 that there is renewed interest in the nature of knowledge as embodied as well as in  
 292 experiential, practice-based learning that involves all senses. Touching the screen is  
 293 the main means of interaction with mobile phone and tablet interfaces.

294 This focus on the haptic and the tactile and the material basis for the transmission  
 295 of knowledge recalls the Khipu (Figs. 3.2 and 3.3), knotted textile record-keeping  
 296 devices used by the Inca in what is today called 'South America.' Although they had  
 297 no written or visual language like the indigenous peoples of Central America, the  
 298 Inca consolidated a vast empire, Tawantinsuyu or 'The Empire of Four Directions'  
 299 between 1438 and 1533. This endeavor was greatly facilitated by the use of Khipus.  
 300 Although they were at first considered simply mnemonic devices for data storage or  
 301 narration, further study has revealed them to embody a quite complex mathematical  
 302 language, apart from being light and mobile, easily transportable media that fit what  
 303 Innis (1951) described as 'space-biased'.

304 Khipus were frequently organized around a central black cord, the color used  
 305 to represent time. Crimson red was the color of the emperor, purple was used for  
 306 other chiefs, blue for priests, and religious matters, and so on. But while the work  
 307 of Ascher and Ascher (1997) has already rendered very interesting interpretations  
 308 of the ways in which they were used by warehouse keepers and even by narrators,  
 309 as a kind of three dimensional language, it is the hypothesis put forward by Gary  
 310 Urton, Professor of Anthropology at Harvard, that is more relevant to us here. Indeed,  
 311 Urton contends that khipus encoded language in a similar way to the binary code  
 312 employed by today's computers. Weavers could choose between a number of yes/no  
 313 conditions to be met, such as using cotton or wool, a spin or a ply direction for a

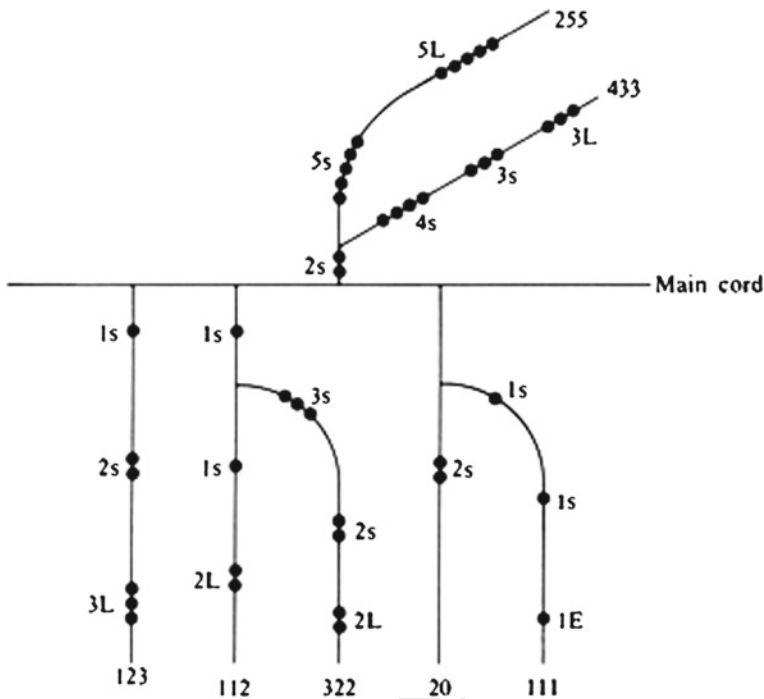


Fig. 3.3 The Mathematical language of the Khipu. Source <https://quipus.wikispaces.com/How+It+Works>, accessed 15 Apr 2016, CC BY-SA 3.0

314 string, the direction of the knot attaching the pendant string to the primary one, which  
 315 could be from the front or from the back, and the direction of the slant of the main  
 316 axis of each knot. This would provide a seven-bit binary array for each knot, which  
 317 is enough for 128 permutations (Urton 2003). These could increase to 1536 if the  
 318 24 colors that were employed were also considered as part of the coding. Although  
 319 only 600 khipu's survive, ongoing research is compiling a database of patterns in the  
 320 arrangements of knots.

321 In a similar way, Angela Haas has persuasively argued that the wampum, shell  
 322 beads usually shaped into belts by indigenous peoples of North America, and which  
 323 were frequently used as money, were also used to record important events or treaties  
 324 in a three dimensional way. For instance the Two Row Wampum Treaty of 1613  
 325 between representatives of the Dutch government and the Iroquois, made in what is  
 326 today the state of New York. It declared the mutual respect and peaceful coexistence  
 327 of the two parties, which should from then on be regarded as brothers, and not as  
 328 fathers (the Dutch) and sons (the Iroquois), as the Dutch had proposed before. It  
 329 features two parallel purple lines in a white background. Of this system of recording,  
 330 Haas (2007, 19) writes:

331 In order for wampum to be communicative, a hybridization of the oral tradition and sym-  
 332 bolism is woven into the material rhetoric. [...] the technologies woven into the belt have  
 333 communicative agency, as with the colors of the shells and the design patterns. The cultural  
 334 context and community where the wampum resides is yet another source of meaning that  
 335 gets encoded [...]. Thus wampum is a hypertext of communicative modes—all of which  
 336 contribute to cultural knowledge production and preservation.

337 The importance that indigenous peoples accorded to embodied knowledge leads us  
 338 to the next section, namely the use of performance as a means to preserve knowledge,  
 339 that is proving most suitable for digital media.

### 340 *Social Memory: Storage and Performance*

341 Social memory refers to what and how societies remember. Museums, libraries, and  
 342 archives, with their focus on formal or canonical social memory, suited the relatively  
 343 slow pace of change of analogue media. But as cultural production increasingly  
 344 becomes ‘born digital,’ and the tools and means by which we keep social memory do  
 345 so as well—such as documentation, records, storage, object management systems,  
 346 and so on—a crisis of memory is being triggered.

347 Initially, in the realm of digital art, ephemerality was embraced with references to  
 348 Navajo art: “one could ask if a lot of what is by some classified as ‘Net Art’ should  
 349 not be seen as [...] art just for the moment itself [like] the ceremonial sand drawings  
 350 of the Navajo, only meant to exist during the ceremony” (Van Tijen 1999). However,  
 351 when dealing with knowledge rather than with specific artistic products, the crisis in  
 352 remembering that new media have created can also be regarded as an opportunity to  
 353 revisit models and practices of social memory, since the means traditionally used by  
 354 indigenous peoples to store and disseminate knowledge, namely, proliferation and  
 355 performance, are again proving to be profoundly germane to the needs of digital  
 356 media cultural production.

357 Friars that arrived in the ‘New’ World in the fifteenth century claimed indigenous  
 358 peoples had no past because they had no writing. Knowledge, such as the carving  
 359 of masks, playing music, tying knots in robes to signify marriage and so on, with its  
 360 embodied and performed nature, was not regarded as requiring or signaling exper-  
 361 tise. Yet Diana Taylor contends the rift did not lie “between the written and the  
 362 spoken word, but between the archive of supposedly enduring materials (i.e., texts,  
 363 documents, buildings, bones) and the so-called ephemeral repertoire of embodied  
 364 practice/knowledge” such as spoken language, ritual or dance (Taylor 2003, 19).  
 365 The analogy with the repertoire rightly conveys the way that each performance both  
 366 repeats and modifies the scripted notation, making each performance at the same time  
 367 a repetition and a unique iteration, an event. In like manner, it can be argued that  
 368 those programming open software, contributing to Wikipedia, or using YouTube as  
 369 raw material for their own videos, constantly engage in the scripting and rescripting  
 370 of what we can call the digital repertoire.

371 This means that many of the ‘bodies’ that perform new media—a browser running JavaScript,  
 372 a Playstation running C++, an Intel CPU running machine language—can be modified and  
 373 distributed inside emulators and other virtual environments [...] as outlandish as preservation  
 374 through proliferation may sound to civilised ears, it is the practice native to indigenous and  
 375 new media creators (Rinehart and Ippolito 2014, 169).

376 It is for this reason that where Taylor claims that books can be burned, but  
 377 “the performative traditions of indigenous people from Oaxaca to Okinawa live on”  
 378 (Taylor 2003, 20), Rinehart and Ippolito (2014, 170) add that “the twenty first century  
 379 may never know the remarkable luminescence of [Eva] Hesse’s sculptures<sup>3</sup> but  
 380 the future of the mapping<sup>4</sup> and Mario is assured.”  
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### 381 Conclusions

382 It seems only fitting to end this chapter with a quotation that summarizes both the  
 383 kinship of digital media and indigenous cultural practices which I have argued is  
 384 so close, and the place of originality as another category that has changed meaning  
 385 when viewed through the prism of computer language (L’Hirondelle 2014, 148):

386 I do not invent or claim to be the creator of the information contained here. I am like a compiler  
 387 who assembles information collected from other sources in order to produce something—  
 388 this essay is one such result. A compiler, though, is also a computer program that transforms  
 389 code written in one language into another to translate and transform the original source code  
 390 to both create an executable program and/or to parse data that may become meaningful.

391 This chapter, hopefully, has also performed these assembling and translating oper-  
 392 ations to convey the close kinship between the indigenous epistemologies discussed  
 393 and the new digital media. Indigenous people communicated orally and with per-  
 394 formances, and used visual or haptic ‘written’ languages that might not have led to  
 395 establish hierarchies of knowledge or separate ‘arts’ from ‘science,’ but that certainly  
 396 allowed a deep understanding of the world and humanity’s place in it. Digital media  
 397 seem to be bringing about some of these epistemological changes. The many con-  
 398 vergences outlined above propound a vast and fertile territory for cross-fertilization.  
 399 Not only is computer science bound to shed light on the nature of the knowledge  
 400 stored in Khipus, for instance, and thereby extend our knowledge of the past, but  
 indigenous worldviews may well have a deeper impact on their emerging hardware

<sup>3</sup> ‘Expanded Expansions’ (1969) by Eva Hesse, is what the Guggenheim catalog describes as ‘a sculptural embodiment of opposites united. Both permanence and deterioration operate in the piece: fiberglass poles—rigid, durable entities—are juxtaposed with fragile, rubber-covered cheesecloth’ (Guggenheim 2015). Highly acclaimed in its hayday, today it is a rigid skin, wrinkled and decomposing in a wooden sarcophagus at the museum.

<sup>4</sup> A creature that can be considered Brazil’s Big Foot, extinct long ago but surviving on the oral accounts of Amazonian indigenous tribes. Paleontologists are allegedly beginning to accept other indigenous stories as valid sources of information on extinct species (Rinehart and Ippolito 2014, 168).

Arthur C.

401 and software, extending into the future. Clarke (1973, 21) once famously said that  
 402 “any sufficiently advanced technology is indistinguishable from magic.” Or, I would  
 403 add, from lore of the First Nations of the world.

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