THE ROLE OF AFFORDANCES IN THE DEINSTITUTIONALIZATION OF A DYSFUNCTIONAL HEALTH MANAGEMENT INFORMATION SYSTEM IN KENYA: AN IDENTITY WORK PERSPECTIVE

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Appendix A

Number of Health Records Information Officers (HRIOs) by District Between 1980 and 2008

Districts	Number of HRIOs
Baringo District	1
Kisumu District	1
Kitale District	1
Meru District	1
Mombasa District	2
Nairobi District	(4)*
Nakuru District	1
District in Eastern Province	1
Turkana District	1
Unknown district	3

*These officers moved from another district included in the list.

Appendix B

Number of HRIOs by County in 2015 ▉

Counties	Number of HRIOs
County in former Coast Province	1
County in former Rift Valley Province	1
County in former Eastern Province	1

Appendix C

Guide to Data Interpretation ▉

Table C1. Definitions of Identity Work		
Means of Identity Work	**Definition**	**Source**
Direct identification	Direct identification of individuals and their attributes (e.g., honest, dishonest)	Lok 2010
Indirect identification through group categorization and affiliation	Identifying individuals with a social group or category (e.g., being the member of a profession or professional association)	Alvesson and Willmott 2002
Indirect identification through prescribing and describing practices, rules, and responsibilities	Individuals' self-association with practices and responsibilities imply the adoption of a particular identity	Alvesson and Willmott 2002; Lok 2010
Indirect identification through the definition of others	Individuals define themselves through the definition of others (e.g., if they define others as dishonest, they imply that themselves and the social group that they represent are honest)	Alvesson and Willmott 2002; Lok 2010
Indirect identification through the definition of the general context	Context implies any identifying attributes of an individual or social group that are valued (e.g., drive for teaching excellence in higher education implies that academics are "good researchers" as well as "good teachers")	Alvesson and Willmott 2002; Lok 2010
Tension between professional (or organizational) identity ("who we are") and social identity ("who they think we are")	Tension between professional (or organizational) identity and social identity triggers identity work through which individuals seek to realign their own sense of self with how others perceive them	Boudreau et al. 2014; Watson 2008
Indirect identification through the definition of the work environment and artifacts	The work environment and its artifacts can have meanings that people attach to their identities (e.g., a librarian might feel strongly attached to the physical library environment and its books)	Boudreau et al. 2014
Role claiming and use	Individuals challenge a threat to their identity by affirming and enacting their role in society	Creed et al. 2010
Identity-protection response	Individuals seek to change negative attitudes that they perceive as a threat to their identity	Petriglieri 2011
Identity-restructuring response	Individuals restructure their identity in response to change	Petriglieri 2011
Enhanced role performance	Individuals enhance their role performance by playing a new function in society and, thereby, form a new professional (or organizational) identity	Leung et al. 2014

Table C2. First Era: The Disruptive Identity Work of Medical Records Officers at the Hospitals		
Means and Types of Identity Work	**Data**	**Interpretation and Coding**
Indirect identification, through group categorization and affiliation (Alvesson and Willmott 2002)	"I don't find any way in which we can separate the medical records personnel and the health information personnel … the medical records maintained and analyzed by the medical records personnel are the source of health information … the two are complementary" (MRO's letter, Ministry of Health 1984).	Identifies medical records personnel with health information personnel. Shows that "medical records personnel" and "health information personnel" were equivalent for practical purposes, indicating that a new identity of health records and information officers was taking shape. *Coding*: medical records officers as health records and information officers.
Indirect identification, through prescribing or describing practices, rules, and responsibilities (Alvesson and Willmott 2002; Lok 2010)	"When we started operating in the hospitals we had nothing to do with information, we were only processing patients' documentation. But then, with time, information has become part of the health records and information personnel [to such an extent that] one cannot do without the other" (Interview with HRIO).	Highlights the fact that MROs were an important "source of health information" through the patients' records they were managing. Health information and their cadre were mutually dependent, one could not exist without the other. *Coding:* HRIOs' identification with information.
Direct identification (Lok 2010)	"The health records and information management profession … is the custodian of health information" (Interview with HRIO).	Directly identifies MROs as "custodians of health information." We consider such self-identification the expression of their identity. We also think that this definition of identity captures the intimate connection between MROs' identity and information. *Coding*: MROs as "custodians of health information."
Indirect identification, through the definition of others (Alvesson and Willmott 2002; Lok 2010) Tension between professional identity ("who we are") and social identity ("who they think we are") (Boudreau et al. 2014; Watson 2008)	"Out of the [Medical Training Center in 1992], as we went to hospitals, information was never taken seriously … people [at the hospital] knew a doctor, a nurse, the laboratory technician, a cleaner … for them [health information] was paperwork …. We [as Medical Records Officers] understood the power of information [and] how it [could be used] to make decisions" (Interview with HRIO).	Identifies people at the hospital as lacking understanding about the usefulness of health information (health information was "paperwork"), thereby positioning MROs as *information experts* (i.e., those who understand the "power of information"). *Coding*: MROs as information experts. It also indicates that the negative perception of MROs as performing "paperwork" at the hospitals, namely, their social identity, posed a threat to their professional identity as the experts who understood "the power of information." *Coding*: tension between MROs' social and professional identity.
Indirect identification, through the definition of the work environment (Boudreau et al. 2014)	"We asked for a computer in a hospital, but they did not understand … why [we needed] a computer …. [One computer] was in the doctor office … doing nothing … We were desperate to be given data … but people did not take us seriously" (Interview with HRIO).	Highlights that MROs were not able to perform as *information experts* because of lack of computers and resources to process data in their work environment. *Coding*: MROs not able to perform as information experts.

Table C2. First Era: The Disruptive Identity Work of Medical Records Officers at the Hospitals (Continued)		
Means and Types of Identity Work	**Data**	**Interpretation and Coding**
Identity-protection response through which individuals attempt to change the attitudes of those people who are a potential source of threat to their identity (Petriglieri 2011)	"If you cannot convince the medical doctor in charge of the [hospital] [of the value of information], you may not get resources. So [we tried to change] their attitude [toward information in order for them to say]: 'Oh, it is necessary! Let us also allocate some money [for a computer].' With the easy retrieval of information and easy compilation of data, they appreciated that this com-puter was necessary" (Interview with HRIO).	Implies that affordances of "retrieving and compiling data" were the means by which MROs attempted an "identity protection-response" meant to change doctors' attitudes toward information. *Coding*: affordances as *means for attitude change*.
	"Doctors in charge of the hospitals never used to care about information. We used to tell them that without health service data, it was hard for them to understand what patients in that area were suffering from …. We would show them how the data could be used to see the finances and man-hours used to treat the first 10 causes of morbidity … Those doctors who were able to use those data could manage the service very effectively" (Interview with HRIO).	Implies that MROs' identity-protection response generated affordances that could change attitudes that threatened their identity and could therefore disrupt institutionalized practices such as ineffective use of information among doctors. *Coding*: identity-protection response as *disruptive identity work*.

Table C3. First Era: The Legitimizing Identity Work of the National HMIS Office		
Means and Types of Identity Work	**Data**	**Interpretation and Coding**
Indirect identification, through prescribing or describing practices, rules, and responsibilities (Alvesson and Willmott 2002; Lok 2010)	"Recently Health Information System ([i.e., the national HMIS office]) … have been assigned the task of being responsible for all Health Information within the Ministry of Health. This system will have the following functions: to undertake the collection, analysis, publication, and dissemination of information necessary for planning, administration, and research work" (HIS 1981).	Identifies the national HMIS office as the unit "responsible for all health information within the Ministry of Health" and with the functions of collecting, analyzing, and disseminating data for the Ministry of Health. *Coding*: national HMIS office as unit responsible for health information.
Direct identification (Lok 2010)	"[The national HMIS office], being the center for information in the Ministry, should be allowed to control all the data files from other departments and programs" (HIS 1992b).	Identifies the national HMIS office as the center for information in the Ministry of Health. *Coding*: national HMIS office as the center for information.
Indirect identification, through the definition of others (Lok 2010; Alvesson and Willmott 2002)	"The Ministry of Health had not made the information system as a core business. They did not see the need [to] come for the information and hence they were not putting enough resources into the information system" (Interview with ex Head of Department).	Highlights the Ministry of Health's lack of interest in information and indirectly identifies the national HMIS office ("the information system") as the unit in charge of information within the Ministry of Health. *Coding*: national HMIS office as the unit in charge of information.
Direct identification (Lok 2010) Tension between organizational identity ("who we are") and social identity ("who they think we are") (Boudreau et al. 2014; Watson 2008)	"Planning was collecting the same data, the health sector [department] was doing the same. So, you see, the [national HMIS office] had become redundant [because it was not supported. By contrast, we wanted] to make sure that we had an information center of excellence [catering for] reliability of data, timeliness, report writing, and information sharing" (Interview with former Head of Department).	Identifies national HMIS office as the "information center of excellence." *Coding*: national HMIS office as the "information center of excellence." It also highlights that other departments perceived the national HMIS office as unnecessary for the production of information. The social identity of the national HMIS office (i.e., how other departments in the Ministry perceived them) represented a threat to their desired organizational identity as the center for information. *Coding*: tension between national HMIS office's social and organizational identity.
Identity-protection response (Petriglieri 2011) through role claiming and use (Creed et al. 2010).	"The role of the [national HMIS office] in the Ministry is to [serve] other departments with the most needed information for planning purposes. It also functions as the data bank for all types of data in the Ministry (HIS 1992a)." "The [national HMIS office] lost control of all its resources …. The resultant inefficiency hurt the Ministry as a whole [since] the department has been unable of providing data for planning. It is strongly felt that for [the national HMIS office] to function at its maximum efficiency it needs to be recognized as a division ([an independent unit]) in the Ministry" (HIS 1992a).	Show how the national HMIS office engaged in an identity-protection response by claiming their role as the data bank for all types of data in order to request more resources and to be turned into a more independent organizational unit of the Ministry. *Coding*: identity-protection response by claiming role as the data bank of the Ministry.

Table C3. First Era: The Legitimizing Identity Work of the National HMIS Office (Continued)		
Means and Types of Identity Work	**Data**	**Interpretation and Coding**
Identity-protection response through which individuals attempt to change the attitudes of those people who are a potential source of threat to their identity (Petriglieri 2011)	"We have worked for many years to enable the 'gurus' in this Ministry to understand what we are [by showing] them [the information services] we can provide, how we can use the data we have collected … to [prove disease incidence and prevalence]" (Interview with HRIO). "I remember once, a HMIS officer with a team [told planners of the Ministry of Health]: 'I can place the information [you need to justify] the budget.' So they came back and collected the data to justify their request" (Interview with HRIO).	Imply that MROs at the national HMIS office sought to change the negative attitudes that threatened their identity by persevering in the collection and reporting of data to prove their value as the "information service provider" ("what we are"). *Coding*: identity-protection response.
	"When it was learned that a district is endeavoring to compile reports for each of the four quarters of 1991, they were informed that reports are to be prepared for only the most recent quarter for which data is available—not for multiple back quarters" (DHMIS Task Force 1992).	Implies that MROs at the national HMIS office were not fully aware of the value of the information they produced. The affordances they realized as part of their identity-protection response, such as "collecting and compiling data reports," were directed toward demonstrating the value of their existence as the center for information to others. These affordances were thus less likely to lead to changes in attitudes toward information and data management routines. *Coding*: affordances as *means for identity survival.* It also implies that the national HMIS office's identity-protection response was just an attempt to justify its existence by ceremonially performing its threatened identity. *Coding:* identity-protection response as *legitimizing identity work*.

Table C4. Second Era: The Reinforcing Identity Work of the National HMIS Office		
Means and Types of Identity Work	**Data**	**Interpretation and Coding**
Indirect identification through definition of general context (Alvesson and Willmott 2002; Lok 2010)	"Some [counties] are still not working …. [Compared to] when we used to have great power and force [on] them to report, that autonomy in terms of reporting [to] the national level sometimes is positive and sometimes is negative" (Interview with HRIO).	Implies that the change in context after devolution raised concerns that the national HMIS office could lose power and control over the information collected compared to when it acted as a controlling agent over data reporting. *Coding*: national HMIS office as a controlling agent over data reporting.
Indirect identification through pre-scribing or describing practices, rules, and responsibilities (Alvesson and Willmott 2002; Lok 2010) Identity-protection response (Petriglieri 2011) against threat of status loss (Kyratsis 2017) through role claiming and use (Creed et al. 2010)	"We did not want fragmentation … Counties are managing health information, but the main central repository still remains at the central level … they have to send all the data to the national level" (Interview with HRIO).	Identifies the national HMIS office as the central repository of all health data, a role that it claims in response to the threat of IS fragmentation and potential loss of control over health information. *Coding*: national HMIS office as the central repository of all health data; identity-protection response through claiming the role of central repository.
Indirect identification through artifacts (Boudreau et al. 2014) Identity-protection response (Petriglieri 2011)	"We decided that we, at the national level, will revise the data collection [forms]" (Interview with HRIO). "DHIS has centralized and standardized the [reporting forms]. The people at the [national HMIS office] can control the [reporting forms]. So the only [reporting forms] that we use are approved by the Ministry [through the national HMIS office]" (Interview with HRIO).	Highlight the importance of overseeing the revision of data collection forms to control the information that was reported and consolidate the national HMIS office's status as the central repository of all health data. *Coding*: national HMIS office as the central repository of all health data; identity-protection response as *reinforcing identity work.*
	"All information is reported through a single channel. [This gives] more power to health information officers … for controlling the information other than when we [used to have] many … parallel reporting systems" (Interview with HRIO).	Implies that the affordance of "reporting data through a single channel" linked to a central data repository increased the power of HRIOs as "controllers" of health information. *Coding*: affordances as *means for identity reinforcement*.
	"[There is the tendency toward] central local control [characterizing] a struggle [for power]. People are not very used to decentralization. They are too used to reporting data …. People still set accountings without using the health information [and prepare] budgets without referring to DHIS" (Interview with medical officer).	Implies that the affordances that HRIOs at the national HMIS office realized within the context of reinforcing identity work functioned as means for identity reinforcement and reproduced routines of vertical data reporting. *Coding: reinforcing identity work* can strengthen routines of vertical reporting.

Table C5. Second Era: The Transformative Identity Work of HRIOs at the Counties		
Means and Types of Identity Work	**Data**	**Interpretation and Coding**
Enhanced role performance (Leung 2014) and identity-restructuring response (Petriglieri 2011)	"We are empowered, we are able to do things that we were not able to do before. [Now with DHIS2] I am able to do analysis … and discover the pattern in the data. I have the time to look at the data whereas [with the manual system] most of the time was dedicated to data entry. Now [health records information officers help managers] understand the indicators and … come up with interventions. We can give more interpretation and more analysis than the managers" (Interview with HRIO).	Implies that the affordances that HRIOs could realize thanks to DHIS2 empowered HRIOs by giving them more time to analyze data and enabling them to advise their county heads on health services manage-ment. These new possibilities for action resulted in enhanced role performance and, therefore, the formation of a new identity. *Coding*: affordances enable enhanced role performance and identity restruc-turing (*transformative identity work*).
Direct identification (Lok 2010) Identity-restructuring responses (Petriglieri 2011)	"DHIS has had very much [impact] on [HRIOs] profession. [In] other days we used to be manual. Now, you can guide the health sector, you can guide everybody, you can know what is happening, you can easily identify the gap [by comparing] national indicators. DHIS has made work much easier [from the point of view of] a profes-sional for health information manage-ment" (Interview with HRIO).	Identifies HRIOs as "professionals for health information management." *Coding*: HRIOs as professionals for health information management. It also implies that the affordances that HRIOs realized through DHIS2 enabled them to restructure their identity as professionals for health information management. *Coding*: affordances as *means for identity change*.
Indirect identification through prescribing or describing practices, rules, and responsibilities (Alvesson and Willmott 2002; Lok 2010)	"[In some counties [HRIOs are] assis-tants to the Medical Office Head … HRIOs are the ones that know informa-tion [and] are responsible for health information. In monthly and quarterly [review meetings], they look at the data and they … analyze [and] compare … indicators [and prepare] some [work plans] based on information" (Interview with HRIO).	Indirectly identifies HRIOs as *health information experts* (i.e., those who are responsible for and "know information" to advise health managers). *Coding*: HRIOs as health information experts.
Indirect identification through prescribing or describing practices, rules, and responsibilities (Alvesson and Willmott 2002; Lok 2010)	"Counties [have started] talking health because they have a vibrant and active information manager. [Those counties] where our information officers … have a say in the county parliament [and] in budgeting are doing very well in terms of reporting. They know where they have problems [and] where they tap their money" (Interview with HRIO).	Indirectly identifies HRIOs as "informa-tion managers." *Coding*: HRIOs as information managers. It also suggests that the transformative identity work of HRIOs contributed to the deinstitutionalization of ineffective use of information among county administrators, who, thanks to the support of HRIOs acting as infor-mation managers, could "talk health." This means that information managers were able to use health information in managing health service resources. *Coding*: *transformative identity work* enables deinstitutionalization of ineffective use of information.

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