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Scaling of HIS in a global context: Same, same, but different



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ABSTRACT

Scaling of information systems is a field of research with growing importance. This paper presents the story of scaling of an artifact (called District Health Information Software – DHIS) and associated principles and practices around a health information system that has taken place over 15 years, both within and between multiple developing countries. Through the lens of the story of the artifact over its trajectory of development and implementation in multiple contexts and time, we develop insights that challenge traditional thinking around scaling. Scaling is not about constant gains and expansion, as is often assumed, but involves a dichotomy of losses and gains, associated with each step or translation in its process of movement. We draw upon Latour's insights on circulating references to analyze this dichotomy of loss and gains, conceptualizing the process as circulating translations. We contribute to the technology transfer literature in arguing that the process of transfer is not about a "parachuting" from point A to B, or a "design from nowhere" but something which occurs in a series of small steps, where with each step new socio-technical configurations are created which not only shape subsequent steps, but also redefine the content of the artifact. In this way, we are in line with findings from the social studies of technology, but differ in that our artifact of study – software – is more "virtually immaterial" than machines which had been primarily earlier objects of study. This property of software, coupled with growth of web-based and mobile infrastructure, allows relative ease of circulation across contexts, where it gets redefined and embedded at the same time at the interconnected levels of the global and local. We conceptualize this process of global scaling as being "same, same, but different". We discuss both the characteristics of this process of global scaling, and the channels and mechanisms through which it takes place. Four overlapping conditions that shape this process

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include the software itself, the infrastructure, institutional practices, and ideas – these form the basis for a general framework to understand global scaling of health information systems. Empirically, the story of DHIS is told from its birth in the mid-nineties in South Africa developed on a Microsoft platform to its transformation to a web-based platform, built using Java based open-source frameworks, and now moving through multiple countries. We focus on these dynamics primarily within three countries namely India, Sierra Leone and Kenya.

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1. Introduction

Scaling, or the process of expanding the scope, spread and size of an information system, is a topic which is gaining in importance in contemporary contexts. Amongst other things, this is fuelled by the demands of globalization that requires the same system to be spread to multiple contexts (Monteiro & Rolland, 2002). The same is also the case with health information systems (HIS), where global agencies like the World Health Organization (WHO) and the Global Fund promote HIS strengthening in multiple developing country contexts. The increasing use of open source applications for HIS (Braa & Sahay, 2012) which carries with it the potential for customization and reuse, heightens this process of expansion of systems, both geographically and functionally.

In information systems research, studies have primarily focused on projects within local settings and described scaling to follow a “replication” logic, mimicking as in a natural system where the various branches have the same structure as the whole plant (Eoyang, 1996). Similarly, the technology transfer literature often describes the movement of technology across countries to also follow a replication logic as the “same” system – System A is sent from place x to place y where the box is received, unpacked and A is installed. However, within our perspective of global scaling, technology A when moved from place x to y, would retain some of the “sameness” but through the very process of movement across different socio-technical domains, will also acquire elements of “differences” – leading to the scaling process being “*same, same, but different*”¹. This represents a process of technology “translation” (as contrasted to transfer), exemplified by Akrich's (1992) study of how technology gets “translated” in every step of its movement across countries.

Our analysis concerns “global scaling” of HISs across multiple developing countries. This has two key points of departure from Akrich's work. While Akrich described the story of a forest pulping machine, our focus is on software, surely “less material” than machinery, a property we denote as “virtual immateriality”. While this higher degree of immateriality enables easy transportability across contexts, it also makes it vulnerable to greater “interpretive flexibility” (Orlikowski, 1992; Pinch & Bijker, 1984), as different social groups have the opportunity to engage with the software and adapt it to their local context. The second point of departure is that unlike Akrich's story of a movement of technology from one country (Sweden) to a second (Nicaragua), our analysis focuses on understanding scaling processes in global, implying multiple country contexts, and also within the same country in different settings and spanning different domains of use. These points of departure make global scaling of (H)IS to be qualitatively different from technology transfer of a machinery involving two countries. While the latter focuses primarily on the dimension of geography or institutions, our analysis spans multiple dimensions such as system functionality, its inherent complexity, user maturity, and processes of learning and adaptation in new contexts (Braa, 1997; Sahay & Walsham, 2006). The global dimension necessarily shifts the perspective of scaling from a bilateral movement from country A to B, to a networked view involving multiple locations at the same time, and also at different points of time.

¹ In the first review of this paper, it was pointed out to us that the term “same, same, but different” should perhaps be “same, but different”. Some investigations revealed that various versions of this expression exist around the world, a finding which rather coincidentally fits well with the theme of this paper. We have thus opted to stay with the term originally selected, reflecting the fact that even global expressions are “same, same, but different”.

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