

Introducing a Mobile Health Care Platform in an Underserved Rural Population: Reducing Assimilations Gaps on Adoption and Use via Nudges

By

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Measurement techniques for successful healthcare platform programs are constrained due to data limitations. Building on existing assimilation gap research and designing artifacts that include nudging techniques, this study identifies concepts that display assimilation gap narrowing methods that improve healthcare platform design. Using elaborated action design research (EADR), each artifact design cycle follows a process map to improve adoption and use. The research discovers how adoptable a healthcare platform (CareValet) is within a rural population, which strategies most promote adoption, and what strategies might best support use improvement.

In this study, platform adoption is compared as the relative value against each use metric for key stakeholders including consumers (e.g., health plan members), clients (e.g., employer or health plan), and platform developers. Research contributions include the development

of assimilation gap narrowing methods and return on investment (ROI) value graphing tools associated with platform use.

In this dissertation, I studied a rural South Georgia county government health plan. This group was specifically chosen because of the amplified effect the cost of healthcare was having in this region of the

United States. This county has the highest healthcare cost in the U.S. on par with Vail, Colorado, one of the most expensive places to receive healthcare in the U.S. The disparity is that Vail is one of the most affluent communities in the US

and rural South Georgia is one of the lowest income areas in the U.S. By introducing a mobile healthcare platform in the form of a mobile application to the population, this study presented an overall goal to reduce healthcare costs by using techniques to guide these consumers to more efficient healthcare practices and lower cost care options.

This research presents a process for influencing assimilation gaps in healthcare platforms, establishing a methodology that extends the quantifiable practice of traditional assimilation gaps, to multi-level assimilation gaps.

Keywords: Mobile applications, Platform development, Assimilation gaps, Design Science Research (DSR), Elaborated Action Design Research (EADR), Multi-level assimilation gaps, Rural healthcare, Consumer platforms

To address the concerns of high cost healthcare in a low income area, I proposed the following research questions: (1) How adoptable is the CareValet platform in a rural population? (2) Which strategies most promoted the adoption of a consumer healthcare platform in this microcosm of the population? and (3) What strategy might best support use improvement in a digital healthcare platform in a rural community?

Through combined literature review and analysis of implementation strategies in our study population, I addressed the value of these implementation strategies and proposed the following hypothesis: 1) Using the EADR cycle, the CareValet mobile health platform will achieve adoption levels above the national average of 7%. 2) Programming and process decisions made through the EADR cycle will improve enrollment volume. 3) (a) Telemedicine Calls: The CareValet Development Team will improve use by injecting nudge theory in the development of the platform. (b) Appointment scheduling: The CareValet Development Team will improve use by injecting nudge theory in the development of the platform.

Findings

A review of the results suggests that nudging has a positive impact on adoption and has an assimilation gap narrowing effect when promoting use. In other words, the gap between adoption and use was shown to narrow when nudging was introduced.

The results of the study produced interesting findings when observing the combined result of RQ 1, 2 and 3. In measuring the assimilation gap value, from adoption and use, there was a significant narrowing effect after the digital nudge occurred. The assimilation gap model shown in Figure 1 illustrates the narrowing effect between adoption and use over the nine-month period. As adoption leveled off, the use levels continued to grow. Each use, accumulating over time, demonstrates that digital nudging,

Methodology

My initial goal was to promote adoption and use of the platform through Elaborated Action Design Research (EADR) cycles by promoting artifacts that have the capacity to influence these metrics. Then the objective was to observe if there are successful levels of platform adoption in the first EADR cycle. Nudging techniques were used to support successful levels of adoption. After satisfactory levels of adoption are achieved, promotion of use the features available in the mobile healthcare platform were used, however, in this EADR cycle, digital nudging was utilized. The value each instance of consumer adoption was compared to each first instance of use to create the assimilation gap model. To further enhance our study, we proposed nudging techniques as an external influence to narrow the gap between adoption and use. By measuring if there was a narrowing (shows improved consumer value) between adoption and use, or a widening (reduction in value) among these factors, promotes the research benefit.

when promoted, increases use. Digital nudging effects corresponded to a jump in use in the trend line (nudge was introduced in August on the trend line). Thus, the introduction of the digital nudge in the use design cycles appeared to produce a significant narrowing of the assimilation gap. In addition, a gradual narrowing between the level of adoption and use activities was observed through non-digital nudging. This indicates that the mobile health platform has developed a level of stickiness in our rural population.

Using EADR cycles through creating artifacts and introducing nudging show that RQ1 results exceeded the hypothesized 7% adoption levels significantly—resulting in a 48% adoption level over 9 months.

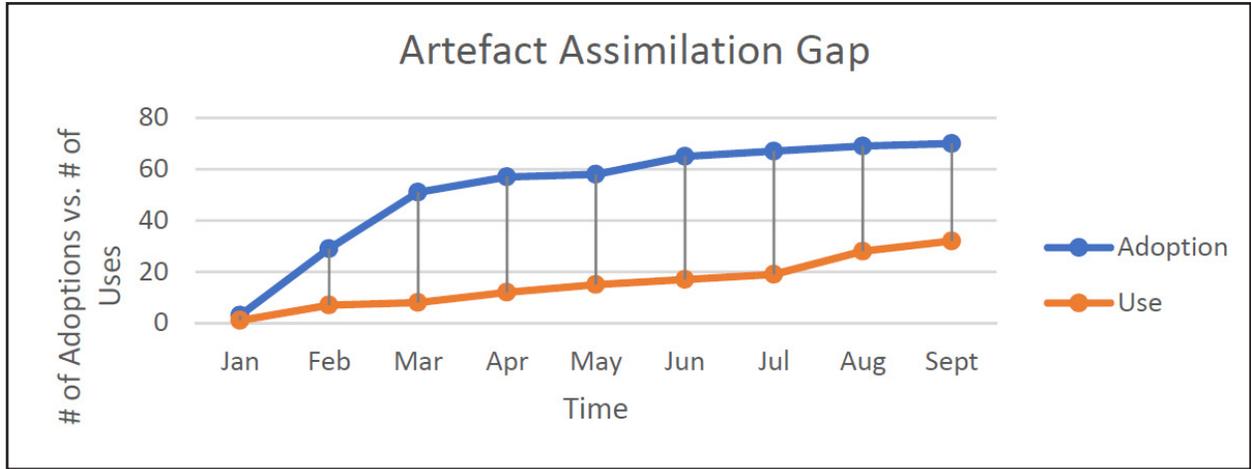


Figure 1: CareValet platform artefact adoption vs. use

Nudge methods within the adoption EADR cycles were most significant between January through April when nudge processed were introduced.

With respect to RQ2, the EADR process, combined with nudge theory, enhanced both adoption and use values. Again, nudging showed value improvement when introduced independently in adoption and use.

In considering RQ3, we observed that the nudging introduced and measured in the EADR cycles improved use in mobile healthcare platforms.

Conclusions

This study was a natural experiment, an empirical study where I observed individuals in a rural area as they were exposed to the CareValet mobile consumer healthcare platform. The processes governing the platform exposed consumers using the application to natural experiments using digital nudging to observe how the subjects would react to suggested forms of use within the platform. The outcomes of the experiments were tracked via the measurements of assimilation gaps and regression data measuring the ROI value. This research makes contributions in four areas: academic research, healthcare consumers, platform developers, and policymakers.

Academic research - Most adoption studies treat adoption and use as a single variable. The value of testing different EADR cycles against adoption and use independently could provide new information about how to address each area in development and through independent measurement. If nearly all prior research of adoption included use, then we would have little data on the true value of adoption (i.e., specifically measured as a standalone variable) of digital platforms. This is not to say that adoption has not been measured. We have few examples of studies that dive into the process of adoption and use in this context, specifically as it relates to mitigation of platform abandonment. Since digital and non-digital nudging was used to promote these two measurements among consumers using a mobile healthcare platform, the research findings should stimulate a conversation in understanding adoption and use in the mobile digital healthcare platform setting, as well as targeted consumer behaviors.

Healthcare consumers - The Consumer Priorities in Healthcare Survey (Deloitte, 2016) revealed consumer preferences that highlighted these gaps, essentially providing a roadmap for policy makers,

platform developers, insurers, and providers to follow. The survey resulted in four important themes defining their desired healthcare experience:

Priority One: Personalization expected via providers.

Priority Two: Economically rational coverage and care choices.

Priority Three: Convenience-driven use of care.

Priority Four: Digitally connected to manage healthcare.

The mobile healthcare platform was modified in each EADR cycle to take into account these consumer priorities as the research questions were addressed, which resulted positive outcome measurements.

Platform developers - In our study, we identified platform adoption as the registration and download of consumer facing applications. Our study dictated that use be measured from the point a consumer uses a function or feature that promotes measurable use value within the application that they've downloaded. We strongly encourage the use of assimilation gap measurements to identify the value of use

in consumer healthcare platform development. Measuring the gaps from the point of adoption to each use function allows the development team to communicate value within the use function or feature being measured. This is a solid way to communicate platform value and stickiness over

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time. Adding a return on investment value point to the assimilation gap chart demonstrates additional value within platforms and this research. We recommend setting a point on the graphic to demonstrate this platform value. This can be done as an average in the overall graphic or can be specifically graphed to measure the success for each use point.

Policy makers - For policy makers, we have demonstrated that mobile healthcare consumer platforms have a great ability to reduce the cost of healthcare, especially in rural populations. Access to healthcare in rural areas is very limited. As such, opportunities to increase access for consumers by leveraging healthcare platforms and their services was demonstrated through the nudged telemedicine offering. These alternative provider access services have the ability to reduce overall health plan costs for employers and consumers alike. Some states have legislated limited telemedicine access. For example, Georgia limits telemedicine providers by restricting them to writing a maximum three day prescription. The patient then needs to physically see a physician if they require additional medication beyond the three day

period. This is an example of how impractical some policies are for rural communities. Since antibiotics normally come in five to ten day supplies, Georgia providers are restricted legislatively to write a prescription beyond that period of time. This forces the rural patient to seek costly emergency or urgent care services and these legislative policies can even have cost effects on urban patients if their illness presents itself after hours or on the weekend when doctors' offices are closed. Policies like these increase overall healthcare costs and increase co-payments to the patient. Rural communities also face resource gaps. In southwest Georgia where our study population resides, there are three specific challenges to access of care:

1. limited primary care physicians,
2. no low cost care access after hours or weekends, and
3. distance challenges (transportation and access).

With limited primary care physicians, these providers are usually fully booked making it difficult for patients to see them on an as needed basis. As such, the only option is for patients to seek care at an urgent care facility. This is a challenge for our population and many rural communities since there are no urgent care options in the area. This forces the patient to seek care at the most expensive option, the emergency room. Many times these visits are not considered emergencies.

A cold or even the flu are not considered emergencies unless they are life threatening. This forces an expensive \$200 co-payment to a non-emergency ER visit that introduces additional out-of-pocket costs to the patient. In addition to the high cost of care, getting to the emergency room can mean a 30-60 mile ride for some members. Public transportation is limited or nonexistent in this region and there is one Uber driver for the entire community. These

rural proximity challenges are not shared by their more urban counterparts as the volume of providers is much greater in urban areas, as are the transportation options. Many public policies are focused around larger medical claims expenses. Chronic and catastrophic care usually dictate policy. However, basic illness treatment left untreated becomes exacerbated and can develop into serious health conditions and increase care costs. This puts an unnecessary strain on the care system, puts the patient at greater and unnecessary health risk, and increases the cost of care to health plans and consumers. Consumer based mobile health platforms that leverage lower costs and easy access treatment options reduce both risk and costs. Policy makers need to elevate these considerations to the top of the list when crafting legislation.

Where to Find Out More

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Review

This article was accepted under the *constructive peer review* option. For further details, see the descriptions at:

<http://mumabusinessreview.org/peer-review-options/>

Author



Joseph Hodges founded Care Valet and currently serves as its president. This company meets a new consumer demand and connects members, via a secure app, to doctors 24/7 for diagnosis and treatment within their provider network. Prior to that, he was founder and CEO of INETICO, a technology-based medical cost containment business that was named the Tampa Chamber of Commerce Small Business of the Year in 2011. Hodges received an associate degree from Tallahassee Community College, and a bachelor's degree in health education and public health from Florida State University. In 2019, he received his Doctor of Business Administration from the University of South Florida's Muma College of Business.