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Cost-Effective Staffing for an EHR Implementation

Executive Summary

- This case study explores costs of electronic health record (EHR) implementation with the nursing super-user role in a metropolitan, not-for-profit health care system.
- Tapping the local pool of unemployed newly graduated nurses as half the required super-user workforce leveraged the technology skills of novice registered nurses (RNs) as trainers of experienced nurses in five hospitals.
- The novel workforce migrated from hospital to hospital, thereby reducing the number of experienced nurses reassigned to super-user duties in each hospital.
- This strategy reduced the amount of contract labor required to backfill nurse super-users' clinical shifts.
- Employment of the recently graduated nurses as RN residents upon completion of the EHR implementation enabled the organization to augment its clinical workforce with expert users of its EHR.
- The proposed innovative model increases super-users, minimizes disruption of core staffing, and dramatically reduces expense.

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The American Recovery and Reinvestment Act of 2009 is the foundation of a complex body of regulations, intended to promote development of a national health care infrastructure. A key subset of those regulations, the Health Information Technology for Economic and Clinical Health Act (HITECH Act), was signed into law on February 17, 2009 (U.S. Department of Health & Human Services, 2009). In addition to strengthening enforcement of privacy and security provisions of the Health Insurance Portability and Accountability Act of 1996, the HITECH Act established incentives to providers and hospitals for the adoption of electronic health record (EHR) technology.

Eligibility for incentives requires the organization verify the EHR is utilized in a meaningful manner. Meaningful use is demonstrated by "the use of certified EHR technology in a meaningful manner…that provides for the electronic exchange of health information…to improve the quality of care" (Centers for Disease Control and Prevention, 2012, para. 1). Selection and implementation of an EHR are not a guarantee of success. Full adoption evidenced by meaningful use of the technology by end-users "is crucial to achieving the intended effects of the systems" (Granlien & Hertzum, 2012, p. 216).

Problem Statement

The project setting was an integrated health care delivery system in California comprising six hospitals, multiple ambulatory clinics, a skilled nursing facility, and an array of subacute, transitional care, rehabilitation, and home health and hospice programs. In response to widespread unmitigated problems with its existing EHR platform, the organization's executives undertook urgent plans to implement a replacement EHR, Epic. A compressed timeline for implementation of the EHR posed significant financial challenges, and led the executive team to aggressively pursue expense mitigation strategies for labor costs associated with the project.

Super-User Support as Driver Of End-User Adoption

A review of the literature, conducted to provide context for the project plan, revealed several studies of factors that influence end-user adoption. A study of EHR implementations in nine hospitals in the United States identified adequacy of training as a key success factor (Silow-Carroll, Edwards, & Rodin, 2012). Other studies reported product ease of use and adequate hands-on support by peer experts were important drivers of end-user acceptance (Gagnon et al., 2012; Granlien & Hertzum,

2012). One study of clinicians during and after EHR implementation in one hospital concluded positive super-user attitudes enhanced end-users' perceptions of EHR ease of use and general usefulness (Halbesleben, Wakefield, Ward, Brokel, & Crandall, 2009). Super-users (SUs) "are clinicians who are provided with extensive training on a clinical information system (CIS) in order to assist the end user" (Simmons, 2013, p. 53). In addition to facilitating end-user skills development, SUs may also impact other employees' attitudes toward the new technology (Simmons, 2013).

Extensive evidence supports the SU model for EHR implementation (Bornstein, 2012; Laney, 2013; Simmons, 2013). During such projects, direct-care staff serving as SUs are relieved of their normal duties to focus exclusively on providing at-the-elbow support for end-users. This temporary reassignment requires alternative coverage to backfill the clinical shifts that would normally be worked by the super-users, who are often the most experienced and knowledgeable members of the direct-care teams. Simon and co-authors (2013) reported backfilling super-user shifts with premium labor resources not only increased hard costs such as labor expense, but produced soft costs in the form of employee and physician dissatisfaction with the disruption of usual clinical work teams. This finding was consistent with the health system's experience during previous technology implementations, and executive leaders were eager to explore alternative approaches to covering super-user shifts during implementation of Epic.

Super-User Workforce Plans

The vendor's specifications for nursing SU resources for this project required a ratio of one SU per six end-users during the Epic implementation. Clinical informatics leaders anticipated needs for SU support to decline to maintenance levels within 4 weeks after the activation event, or "go-live." The number of SUs at maintenance levels was projected as approximately half the number required for implementation. On transition from implementation to maintenance state, SUs would return to their normal clinical duties, and provide informal support for their peers in the course of routine work hours.

The organization's five hospitals and adjacent facilities were scheduled for EHR activation over a 5-month period. Four go-live events were spaced 7 weeks apart, with separate go-live dates for three hospitals, and a fourth event during which two hospitals would simultaneously activate the new EHR. The hospitals did not share staff; as a result, each site required a dedicated SU team for approximately 8 weeks before, and 4 weeks after, the scheduled go-live. In the former period, the SUs would assist with end-user practical training in computer labs and dedicated training spaces. In the 2 weeks immediately preceding the go-live event, the crescendo of preparations would require all SUs to participate in dress rehearsals to test the EHR system for several hours to validate its operational readiness for go-live. On the final day of preparations, the SUs would provide at-the-elbow guidance to clinical end-users creating new medical records for current inpatients. The climax of transition activity would be the switch from the old EHR to the new system, an event referred to as "cutover to Epic" by the vendor.

Cutover would trigger the next phase of super-user activity, during which the entire SU workforce would be deployed throughout all clinical areas. For most hospital departments, SU support was scheduled 24 hours per day; in procedural and outpatient areas operating during specified hours, SUs would be present anytime patients were present, and on call after hours. The SUs' primary responsibility during this phase would be at-the-elbow coaching and reassurance for end-users as they utilized the new EHR and associated workflows. SUs would also serve as troubleshooters for the EHR, maintaining communication between clinical end-users and the project command center, which would dispatch technical support staff to address EHR performance concerns. Super-user support would be in highest demand during the first 2 weeks, after which SU staffing would be gradually reduced until its complete elimination after 4 weeks.

Projecting Super-User Labor Hours

Applying the EHR vendor's formula for calculating the required number of nursing SUs, the organization's informatics team determined the four larger hospitals would each require 110 to 120 super-users, and the smaller hospital approximately 70 nursing SUs. Each RN super-user was scheduled for a total of 196 hours of training and work time. Nurse leaders scheduled contract staff to backfill all super-user shifts because employed staff willing to work overtime would be needed to accommodate anticipated seasonal surges in patient volumes during the implementation period. Contract labor hours to fill the clinical shifts vacated by the SUs included 8 hours of orientation, for a total of 204 contract hours per vacancy.

Nursing Workforce Conditions

A 2012 report on the supply of registered nurses (RNs) in California identified Los Angeles County as one of two counties with the highest number of RNs, with more than 30,000 at the time of the study (Office of Statewide Health Planning and Development [OSHPD], 2012, p. 1). A survey of over 2,000 newly graduated RNs licensed in California between September 2011 and August 2012

revealed 46% were not employed as nurses; 45% of respondents who were not working had graduated with bachelor of science in nursing degrees (Bailey et al., 2013). The rate of new graduates not employed in nursing was slightly lower in Los Angeles and Ventura Counties than for the state as a whole, although at 42% it exceeded the national average of 36% reported by the researchers (Bailey et al., 2013). This surplus of new graduate nurses in the market suggested an opportunity to capitalize on their availability for a cost-effective staffing solution to support the EHR implementation project.

Process Improvement Opportunity

To partially mitigate the negative impact of the EHR implementation on nurse staffing, continuity of care, and labor expense, the Regional Chief Nursing Officer and Regional Chief Nursing Informatics Officer agreed to redesign the standard super-user workforce model. Their aim was creation of a unique supplemental workforce to serve as SUs supporting direct-care nurses during the implementation of the new EHR across multiple hospitals. The proposed model would reduce the number of direct-care staff reassigned to SU roles by 50%, thereby preserving core staff for care delivery and reducing the amount of contract labor hours required to fill clinical shifts.

Conceptual Framework

Although replete with studies of EHR implementation success factors, the literature yielded a paucity of studies exploring the effectiveness of newly licensed members of a discipline as trainers for more experienced colleagues. A recent qualitative study suggested cognitive and learning theories play a role in successful EHR implementation projects (McAlearney, Robbins, Kowalczyk, Chisholm, & Song, 2012). The authors concluded EHR training programs should "move beyond technical approaches and incorporate social and cultural factors to make a difference in implementation success" (McAlearney et al., 2012, p. 294).

Autry and Berge (2011) also explored the relationship of cognitive processes to learning to use technology in their study of learning styles of individuals who grew up in the digital age, and of individuals who experienced only part of the digital age and learned to use technology as it was introduced into their lives. The latter individuals are referred to as "digital immigrants" and "pre-Gen Y" (Autry & Berge, 2011, p. 461), while the former are considered "digital natives" and "Gen Yers" who have been using technology nearly since birth (Autry & Berge, 2011, p. 460). The authors concluded there is an opportunity to leverage the unique generational characteristics of digital natives and digital immigrants to improve the effectiveness of training and development programs. The researchers implied digital natives could serve as valuable role models and enablers for colleagues of the previous generation during the implementation of a new EHR.

Integration of the findings of McAlearney and colleagues (2012) with those of Autry and Berge (2011) produced a conceptual foundation supporting the proposed innovative model of filling super-user positions with clinical novices, the majority of whom were digital natives. Leveraging the ready availability of this segment of the nursing workforce ensured a robust team of SUs to enhance the likelihood of successful EHR implementation and adoption.

Cost/Benefit Analysis

Prospective analysis of the proposed SU staffing model utilized projected hours of RN SU training and staffing and contract RN labor hours to compare anticipated costs (see Table 1.) Each RN SU was expected to spend 196 hours in the role, resulting in an equal number of replacement hours plus 8 hours of orientation for each contract RN. The projected contract RN rate exceeded the organization's average hourly RN salary and benefits rate by approximately 35%.

Projected labor hours for the newly graduated nurses, 50% of the super-user workforce, included the same training provided to the experienced RN SUs, plus new employee orientation, customer service training, and expanded end-user support hours in the 3rd and 4th weeks after each go-live (see Table 1). The title of *Epic Implementation Technician* (EIT) was created to distinguish the newly licensed nurse super-users from experienced nurses serving as SUs. Rotation of the EITs from one hospital to another obviated the need for further super-user training after the first go-live. As a result, each EIT worked 264 hours for the first go-live, and 196 hours for each subsequent go-live event. Additional projected expenses included 1.0 full-time equivalent experienced nurse manager to lead and supervise the EITs for 12 months, the anticipated project duration.

Review of the projections by internal finance experts validated a potential cost avoidance of 36% when compared to use of experienced nurses to fill all super-user positions. The EITs would fill 100% of the super-user shifts in the 3rd and 4th weeks after cutover, enabling the staff nurses in SU roles to return to their normal clinical duties and reducing the duration of contract labor utilization to backfill clinical shifts.

Project Implementation

Over 150 recent graduates of nursing baccalaureate programs were hired and trained as EITs. Although the duties of EITs and RN SUs were identical, use of different titles enabled staff to easily identify experienced RN super-users when clinical expertise was

Table 1.
Opportunity Analysis

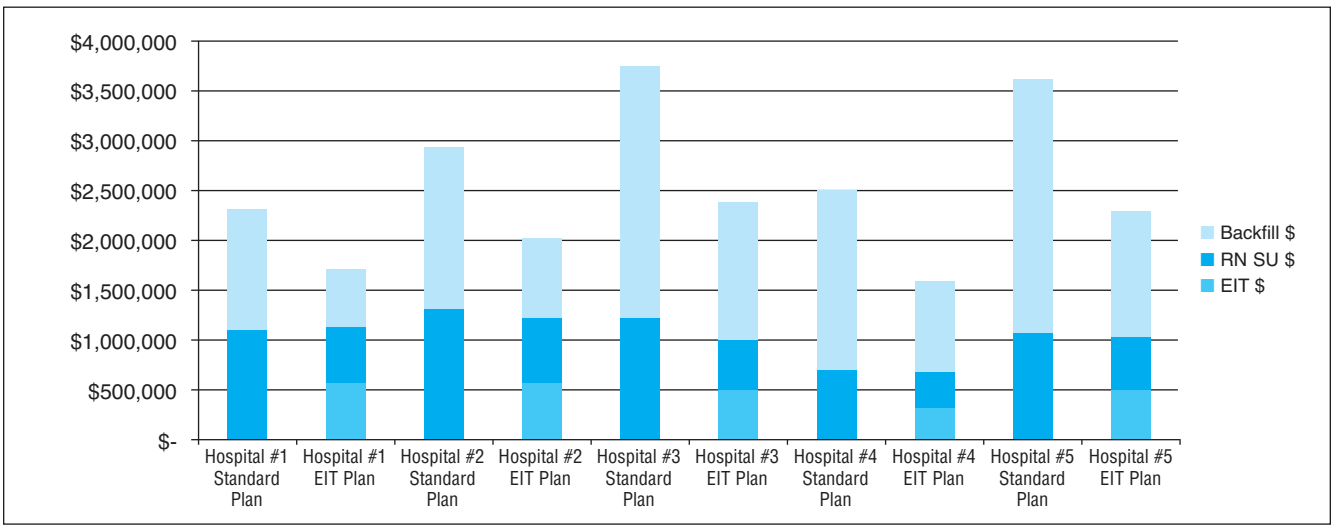
	Paid Hours per Super-User	Contract Labor Backfill Hours
Experienced RN Super-User Plan		
Facility orientation	0	8
EHR end-user training (average hours)	25	25
Patient care planning software training	16	16
Teaching skills for super-user training	3	3
Classroom support for end-users	12	12
Technical dress rehearsal	16	16
Final dress rehearsal	16	16
12-hour shifts 3/week x weeks 1-2	72	72
12-hour shifts, 2 in week 3, 1 in week 4	36	36
Total	**196**	**204**
EIT Super-User Plan		
New hire orientation	8	0
EHR end-user training (average hours)	25	0
Patient care planning software training	16	0
Teaching skills for super-user training	3	0
Customer service skills training	16	0
Classroom support for end-users	12	0
Technical dress rehearsal	16	0
Final dress rehearsal	16	0
12-hour shifts 3/week x week 1-2	72	0
8-hour shifts, 5 in week 3, 5 in week 4	80	0
Total	**264**	**0**

needed for assistance with complex challenges. After a standardized training program, the EITs assisted with end-user didactic training and provided at-the-elbow support for direct-care RNs and allied health professionals during the first few weeks after the EHR cutover. Four weeks after each hospital's go-live, the EITs moved to the next hospital scheduled for EHR implementation, and repeated the cycle of end-user training and support for go-live. The EIT compensation model was structured to promote retention for the duration of the project, at the conclusion of which the EITs were encouraged to apply for RN residency positions at any of the five hospitals. Over 100 EITs were hired as RN residents.

Outcomes

The innovative super-user workforce model reduced labor costs associated with super-user staffing by 31.8%, as compared to the standard super-user model proposed by the vendor. This expense reduction was achieved in spite of total super-user hours having been increased by 35%

Figure 1.
Comparison of Projected Cost for Standard Super-User Model with Actual Cost of Using EITs as Half the Super-User Workforce



NOTES: SU = super-user; EIT = Epic Implementation Technician

over the standard SU model. Figure 1 depicts the comparative expense by hospital, and reveals the most significant element of super-user expense for each facility was contract labor to backfill the clinical shifts vacated by experienced RNs serving as SUs.

Although not as easily measured as financial outcomes, subtle changes in the organization's culture and workforce were also observed. Prior to the project, some nurse leaders and staff exhibited a reluctance to hire large numbers of newly licensed nurses, citing the challenges of training and supporting those inexperienced clinicians. After having observed the EITs' performance as super-users, many of those same nurse leaders and staff were eager to recruit the new nurses to stay on as RN residents. In turn, the EITs hired as RN residents infused increased confidence and competence as users of technology into the clinical staff with whom they worked. Within 12 months of being hired, many of the former EITs were active participants in various nursing councils and informatics teams in their facilities.

Conclusion

The role of super-user is a critical element of an effective EHR implementation project. In spite of the considerable evidence supporting the effectiveness of experienced RNs as EHR nursing super-users, the practice increases project cost and the risk of disrupting continuity of care as a result of reliance on contract labor to fill shifts vacated by the super-users. Tapping into the local workforce of newly graduated RNs serves as a cost-effective means to reduce costs and minimize staffing disruption during the implementation of a new EHR. **$**

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