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Anubhav Arora
Healthcare Design Strategist
anubhav6@mit.edu

Barbara Dyer
Senior Lecturer, Work and Organization Studies
MIT Sloan
bdyer@mit.edu

Thomas A. Kochan
George Maverick Bunker Professor of Management
Professor, Work and Organization Studies
MIT Sloan
tkochan@mit.edu

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A Case Study of Integrating Technology and Work Systems at Kaiser Permanente's Health Hubs

By Anubhav Arora, Barbara Dyer, and Thomas A. Kochan

About the authors: Anubhav Arora (anubhav6@mit.edu) is a healthcare design strategist who has a master's degree in integrated design and management from MIT. Barbara Dyer (bdyer@mit.edu) is a Senior Lecturer and Executive Director of the Good Companies, Good Jobs Initiative at the MIT Sloan School of Management. Thomas A. Kochan (tkochan@mit.edu) is the George Maverick Bunker Professor of Management and a Professor of Work and Employment Research at the MIT Sloan School.

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Abstract

Kaiser Permanente (KP), one of the largest managed care systems in the United States, envisions a care system that is fully integrated into the everyday lives of its patients (members). As a step toward this future, the Kaiser Permanente Southern California (KPSCAL) regional team began in 2015 to introduce a group of modern, technology-enabled ambulatory care clinics. These clinics deploy technology and workplace innovations to address some of the pain points of traditional clinics and to bring health care more seamlessly into members' lives.

In this case study, we examine KP's approach to developing and implementing these innovations. KPSCAL followed an integrated design process that resulted in changes in not only deployed technology but also the broader work system. Instead of being driven by popular technological innovations, KPSCAL focused on specific member concerns with the ultimate aim of improving their experiences. A diverse set of workers and their union representatives—including those from the frontlines—were engaged in the design, implementation, and ongoing operation of the clinics.

The case study helps illustrate one of the central propositions of the MIT Task Force on the Work of the Future: technology produces better outcomes for organizations and the workforce when integrated with work processes and workforce development.

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INTRODUCTION

Driven by consumer expectations for more affordable and convenient health care, innovations in care delivery and technological advancements are changing the way health care is delivered. Emerging technologies—from telemedicine and remote monitoring, to robots transporting supplies and aiding surgeons, to artificial intelligence-based clinical decision support tools—are increasingly being tested and deployed in health care to improve care and decrease costs (Litwin, 2020) (Sim, 2019) (Rajkomar, Dean, & Kohane, 2019) (Fogel & Kvedar, 2018).

The definition of "health" itself is expanding with new data, tools, and technologies available to manage the social, behavioral, and other nonmedical needs of patients (Topol, 2019) (Porter & Lee, 2016) (Murdoch & Detsky, 2013). In this environment, health care delivery is no longer confined to an acute care setting, and new models of physical (community, retail, home, etc.) and virtual (video, phone) care delivery are emerging (Cassel, 2018) (Tuckson, Edmunds, & Hodgkins, 2017). And the industry is experiencing employment growth as well as changes in the ways it funds and delivers its services (US Bureau of Labor Statistics, 2020) (Burwell, 2015).

Kaiser Permanente, (KP), one of the largest integrated managed care systems in the United States, recognizes these shifts in health care delivery and initiated several strategic projects to meet the changing needs of its patients. KP understands that its workforce must both help shape and be shaped by technological innovations in care delivery. Similarly, how work is defined, organized, and delivered must be reexamined.

Indeed, the relationship between advancing technologies and how work will change in the future is one of the central inquiries of our time. Concerns about this issue led the President and Provost of MIT to establish a university-wide Task Force on the Work of the Future in 2018 and charge it to address three critical questions:

1. How are emerging technologies transforming the nature of human work and the skills that enable people to thrive in the digital economy?
2. How can we shape and catalyze technological innovation to complement and augment human potential?
3. And how can our civic institutions—existing and new—ensure that the gains from these emerging innovations contribute to equality of opportunity, social inclusion, and shared prosperity?

The health care sector is a prime laboratory for examining the future of work and its relationship with technology. In this case study, we delve into the second question that was part of the MIT Task Force's charge. One of the central propositions emerging out of the MIT Task Force's work is that technology produces better outcomes for organizations and the workforce when integrated with work processes and workforce development (Autor, Mindell, & Reynolds, 2019).

This case helps to illuminate this proposition by studying a strategy in ambulatory care initiated by Kaiser Permanente in their Southern California region (KPSCAL). This approach, which KSPCAL calls *Care Transformation*, places the patient at the center of an integrated system. The resulting new clinics, called *Health Hubs*, deploy the most advanced technology in the Kaiser ambulatory care system.

We began our inquiry with a focus on technology. We expected to learn how technology was developed in response to and informed by the stakeholders at these clinics, in ways consistent with KP's culture of innovation. What we discovered was a bigger story that encompassed but went well beyond technology. These Health Hubs take a systems strategy to innovation—integrating technology, work systems, and physical space in combination—to deliver the larger goal of improved patient and employee experiences.

The case is organized in five sections. The first describes the study's scope, the setting, and our methodology. The second section traces KPSCAL's design process that established the template for the new Health Hubs. The third section focuses on rollout and execution. In the final two sections, we present our own observations and conclusions.

1. HEALTH CARE AT KAISER PERMANENTE

1.1 Background: Toward Care Anywhere

Digital transformation of health care began in the early twenty-first century with the digitization of patient health records and introduction of computers into physicians' exam rooms (Faddis, 2018) (Wachter, 2015). Following the widespread adoption of electronic health records (EHR) technology, the U.S. health care sector is now in the midst of a second digital revolution marked by increased deployment and testing of new technologies (Topol, 2019). This time, three types of emerging technologies are shaping the future of health care—digital communications and telepresence, semi-autonomous service robots, and artificial intelligence. The goal is for these technologies to act as both valuable associates to providers, supporting decisions on diagnoses and treatments, as well as reliable care managers for patients, supporting the management of their health (Topol, 2019) (Flach, Reynolds, Duryee, Young, & Graley, 2019). The resultant health care system should be personalized, predictive, preventive, and participatory (Flores, Glusman, Brogaard, Price, & Hood, 2013).

Kaiser Permanente makes this future more tangible with a concept the organization calls *Imagining Care Anywhere* (Kaiser Permanente, 2013). Centered on the patient, KP is moving toward a future in which the system of care is a feature of and integrated into everyday life. The following story, developed as a video to fuel internal conversation across KP, illustrates the concept:

> *Leo Montgomery and his wife Rosemary are out for a walk when Leo's wrist monitor sounds an alarm. Within seconds, a virtual assistant is in contact with the couple; in moments, an autonomous medi-car arrives at the curb and soon Leo is seated in the vehicle as a personal health navigator and an on-call physician appear on a video screen. With the help of various diagnostic tools in the car, they confirm an episode of pulmonary edema and discuss treatment options there and then. The navigator connects with Leo's clinical support team to follow up. The clinical team, using decision-support tools, can integrate Leo's health goals and data from multiple sources. Intelligent sensors continue to monitor Leo's activities including sleep patterns, heart rate, and movements. Additionally, all of Leo's medications are incorporated into one patch that he is able to easily apply to his forearm. The home monitoring system allows Rosemary access to a live video stream that she can view when she is at work.*[1]

The vision of *Imagining Care Anywhere* is simple to grasp but not to execute. It relies on technological advances that are not quite ready for prime time (Mathews, et al., 2019) (Topol, 2019). But technology is only part of the story. This future requires a redefinition of the core organizing principles of work and place in the current system of care, from physician-centered and facility-based to patient-centered and ubiquitous. It requires changes in the environments, routines, and capabilities of care professionals and patients.

[1] Pulled from 'A Medicare Story' on Kaiser Permanente's Imagining Care Anywhere website http://imaginingcareanywhere.org/html/journey.html

In this case, we focus on one of KP's recent innovations – *Care Transformation* or *Life Integration* – a project started in 2013 to reimagine ambulatory care in KP's Southern California region through a series of next-generation ambulatory clinics called *Health Hubs*. This long-term project involves a multistage and multifaceted set of technological and organizational innovations for ambulatory care, all designed to move the KP system towards its ultimate vision of *Imagining Care Anywhere* (Figure 1).

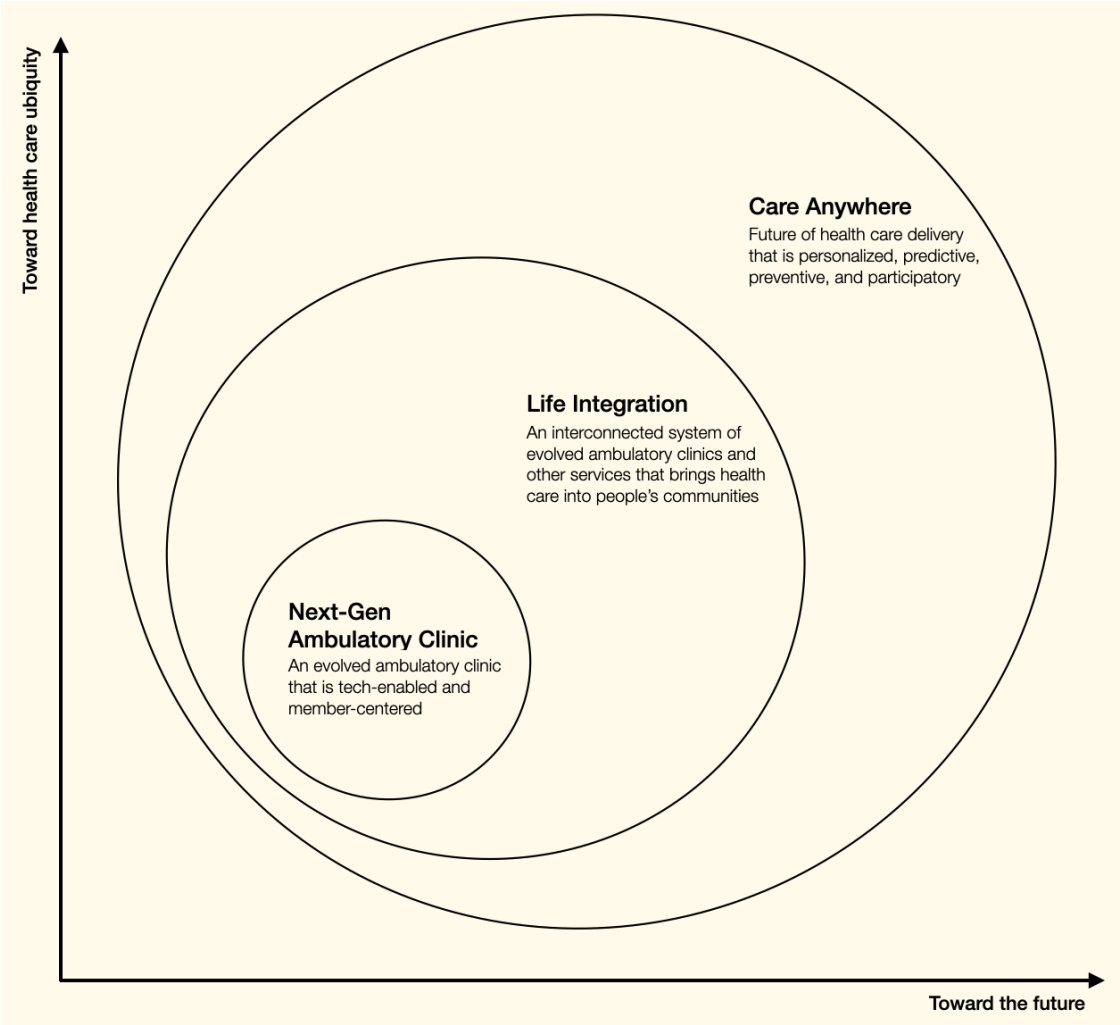

Figure 1: Kaiser Permanente's Health Hubs: a step toward the future of Care Anywhere (authors' illustration)

1.2 Setting: Kaiser Permanente Southern California

Kaiser Permanente is a large integrated managed care system that provides both health care insurance and direct care to its members.[2] Founded in 1945, KP is headquartered in California and is a partnership between Kaiser Foundation Health Plan (KFHP), Kaiser Foundation Hospitals (KFH), and The Permanente Medical Group (PMG). As of 2019, KP provides care to more than 12.4 million members, operating 39 hospitals and 714 outpatient medical clinics

[2] Kaiser refers to its patients as members. We use members and patients interchangeably in this report.

across 8 states[3] and the District of Columbia. KP employs around 23,000 physicians, 63,000 nurses, and 220,000 other staff that include technical, administrative, and clerical employees (Kaiser Permanente, 2019).

In recent years Kaiser Permanente has gained a reputation for being a leader in the development and use of EHR systems and for having the largest, most comprehensive, and longest-lasting labor-management partnership in U.S. history (Kochan, Eaton, McKersie, & Adler, 2009). KP cultivates new technological innovations and dedicates internal groups to support, test, and adopt emerging technologies (Ferguson, 2014; McCreary, 2010).

A regional operational structure enables local experimentation and customized approaches (Figure 2). In each of KP's eight operating regions, its not-for-profit KFHP offers health insurance to its members and invests in the KFH hospitals and outpatient clinics infrastructure. Regional for-profit Permanente Medical Groups provide medical care to the members through its physicians and non-physician staff. Together, they form the regional Kaiser Permanente management teams. For instance, selected members of the Southern California Health Foundation Plan, Southern California Foundation Hospitals, and Southern California Permanente Medical Group form the regional leadership team in Kaiser Permanente Southern California (KPSCAL).

Kaiser Permanente operates under a capitated payment system, which allocates a fixed amount of money per patient per month. This shifts the financial incentive from a payment system based upon generating a high volume of compensable services to one focused on delivering high-quality care. This payment structure is an important part of the underlying foundation that enables a culture of innovation within Kaiser. The culture of innovation recognizes members and frontline workers as critical stakeholders in improving care delivery, driving co-creation and actively participating in strategic projects.

> *"The key is identifying and employing pull strategies versus push strategies. While push strategies are characterized by a person having one great idea and pushing everyone to adopt it, a pull strategy works to draw people in. In a pull strategy, you appeal to the intrinsic desire of the people who are actually on the front lines trying to carry out the overall mission to [get them to] want to do it because they see it as transformative and a valuable tool in order to get to the results."*
>
> – Dr. Benjamin Chu, Group President for Southern California (2014-16)
> (Becker's Health IT, 2015)

National and regional Labor Management Partnerships (LMPs)—between Kaiser Permanente and two groups of unions, the Coalition of Kaiser Permanente Unions and the Alliance of Health Care Unions—engage workers, managers, and physicians at all levels to solve problems and deliver high-quality care and service to members. One of LMP's key teams, Workforce Planning and Development (WPD), provides training and upskilling opportunities to employees to support their learning and development. The Southern California Workforce Planning and Development (SCWPD) team hosts a Jobs of the Future Committee that leads workshops to understand the impact of emerging technologies and innovations on staffing. The Committee is comprised of members from regional and local operations, frontline workers, labor partners, recruitment experts, and subject matter consultants.

[3] The eight states where KP operates are: Hawaii, Washington, Oregon, California, Colorado, Maryland, Virginia, and Georgia.

At the medical facilities level, the culture of innovation and worker participation is furthered by local teams—each led by a manager and worker—called unit-based teams (UBTs). UBTs, launched as a result of a 2005 National Labor-Management Agreement, provide the vehicle through which union members, physicians, and managers work together, combining knowledge and experience to improve Kaiser Permanente's system of care and Kaiser as a place to work.

In Southern California, as of 2019, Kaiser delivers ambulatory care through 234 ambulatory clinics and 15 hospitals serving 4.5 million members. Its patient population is diverse across age, gender, and ethnicity. Fifteen percent of the members are above the age of 65, 65% of the members are Non-White, including 43% Hispanics and 9% African Americans; and there is an almost equal split between male and female members (Kaiser Permanente, 2019). Each clinic reflects the demographic profile of the communities in which it is located. Eighteen ambulatory Health Hubs have been built so far.

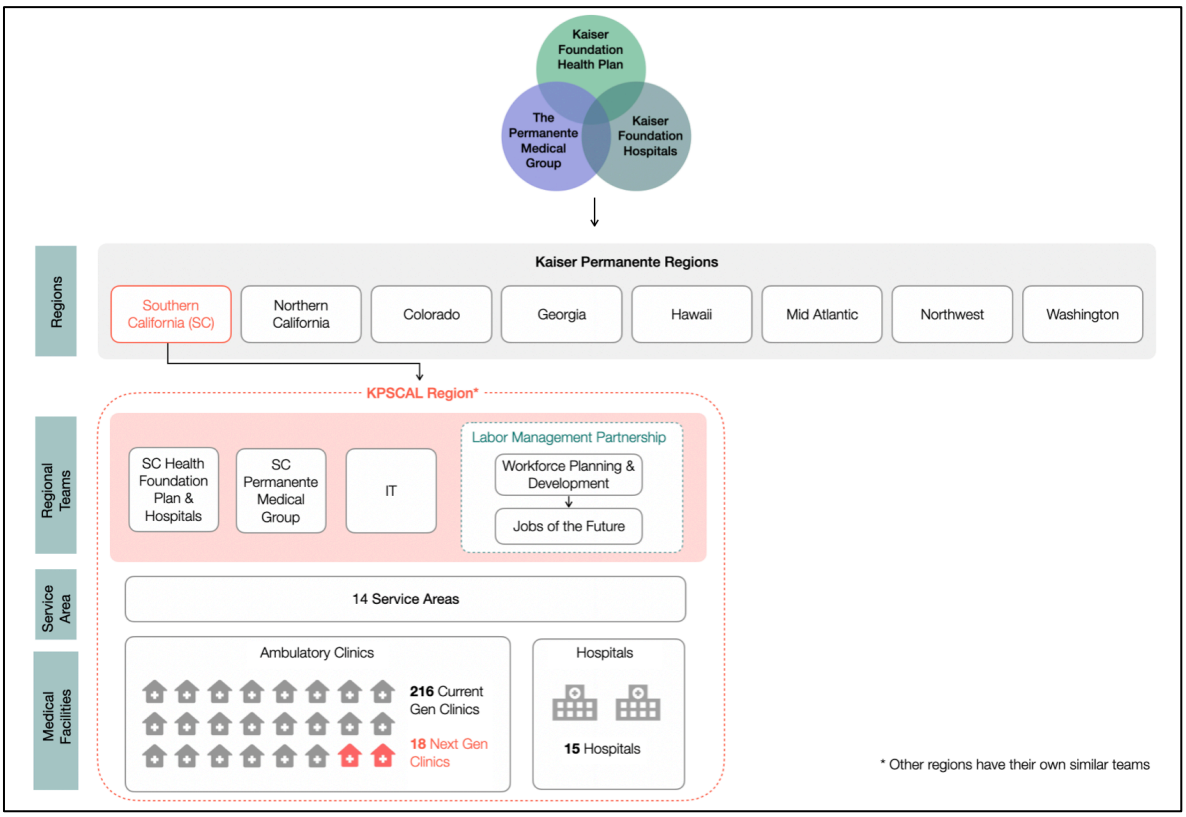

Figure 2: Kaiser Permanente's regional structure and teams in Southern California (authors' illustration)

1.3 Methods

Research Design

This research is an explorative, qualitative case study. We examined multiple cases of work systems in two types (traditional and next-generation Health Hubs) of ambulatory care clinics in Kaiser's Southern California region. Specifically, we studied work systems in four current and six next-generation Health Hubs. We delineate the differences between the two types of clinics in their organization of work and the experiences of members and personnel. We observed the role of technology and its interrelationship with other elements of the work system. We also

examined workforce involvement in the process by which the Care Transformation project was conceptualized and developed within KP including the launching of the individual Health Hubs.

Within the Care Transformation project, we only focus on Health Hubs, since the other project components are still in development. We limit our study to KP's Southern California region, although there are clinics in other KP regions that are modeled after the Health Hubs. We traverse the complete journey from conceptualization in 2013, through development in 2014-15, to clinics that opened between 2015 and 2019.

KPSCAL regional leadership team proposed the clinics that we studied. The primary considerations for selecting these sites were ease of access and availability of the sites and staff for interviews. We selected clinics with differing sizes and start dates for variability. Within the clinics, we focus on primary care services. Other services such as pharmacy, laboratory, and emergency care are outside of the scope of this study. Two regional leaders of the Care Transformation effort were our primary contact persons throughout the project. They also acted as key informants on the background and history of the project.

Data Collection and Analysis

We collected data through multiple sources, including interviews, observations, and internal documents provided to us by KP. Starting in 2019, we began conducting phone interviews with senior leaders at KP and KPSCAL to develop the scope of the case study. We conducted an initial visit to Chino Grand, one of the Health Hubs, to determine the clinics' fit for our purposes and meet our primary contacts at KPSCAL. We also visited Kaiser's Garfield Innovation Center in San Leandro to get a preview of KP's human-centered approach to innovation. To understand the larger technology trends in health care outside Kaiser, we spoke with several industry experts with backgrounds in digital health care, AI, telehealth, and primary care. In total, we conducted 21 interviews during this period.

Between January and March 2020, we conducted two field visits, lasting five days each, across Southern California, visiting 4 current-generation clinics and 6 Health Hubs and interviewing physicians and staff across different departments, roles, and levels. Staff included receptionists, medical assistants, licensed vocational nurses, registered nurses, multifunctional workers, and department administrators. In each clinic, local leadership selected the staff to be interviewed. Besides the interviews, we also took guided tours of the clinics, observing various touchpoints in a patient's journey. Finally, we spent a full day at Kaiser's Tustin Innovation Center observing a kick-off training workshop for master trainers from a soon-to-open Health Hub. We finished our field visits just before COVID-19 cases started to rise in the country.

During these clinic visits, we conducted 73 personnel interviews. The length of the interviews ranged from 20 to 60 minutes with an average of about 45 minutes, and all of the interviews were in person. To encourage a more conversational style of interviewing and participant engagement, we followed a semi-structured interview guide with a set of open-ended questions. Each interview was recorded and later transcribed and stored in a secure cloud database. We also took notes during the interviews and observations, which were reviewed at the end of each day to modify our questions for the following day. The two field visits were separated by a month to allow us to apply our learning from the first visit to the second and focus on gaps in the data.

The interview transcripts, checked for accuracy, together with our notes and KP's internal project documents, formed the primary data that we analyzed. We used ATLAS.ti, a qualitative analysis software program, to organize and code the personnel interviews. In total, 99 codes were created to annotate and highlight useful sections of the interviews; 1053 sections were highlighted in this way. The tool allowed us to go through all of the interviews in a structured manner to identify emerging themes and patterns in the data—from dominant technologies, spaces, and workflows, to personnel feedback and concerns, to personnel perspective on outcomes. More than one researcher analyzed key interviews to triangulate insights and gather multiple perspectives.

To compare regional strategies toward workforce enhancement, we also interviewed labor leaders who represented workforce development and management teams in different regions. Some of these interviews were post-COVID, allowing us to explore Kaiser's response to the crisis. However, detailed analysis of KP's strategies post-COVID and the pandemic's impact on the Care Transformation project is not in the scope of this paper.

2. DEVELOPING THE DESIGN AND TEMPLATE FOR HEALTH HUBS

In 2013-14, Kaiser Permanente Southern California leadership team began to decentralize care delivery. The plan was to build new ambulatory care facilities closer to member communities to improve access. In the process, KPSCAL considered how these new facilities might achieve more than just physical proximity. What if they could use the opportunity as a mechanism to reimagine outpatient care and improve member experience? What should and what could a transformed system of ambulatory care achieve? KPSCAL's Care Transformation project set out to find the answers.

Ambulatory care encompasses a variety of health care services performed outside of hospital settings—everything from assessment and treatment for complex chronic conditions to preventive and wellness care. The overall health of Americans poses significant challenges—with declining life expectancy and high levels of chronic disease and obesity rates—and since the social environment in which people live, work, and play tends to affect health outcomes, ambulatory care services present an opportunity for innovation (Thornton, et al., 2016) (Braveman & Gottlieb, 2014).

Inspired by KP Garfield center's vision of *Imagining Care Anywhere,* KPSCAL applied KP's design process[4] to identify opportunities to innovate. The regional leadership team led the design process and hired external design firms to help them with research, prototyping, and testing. They formed an interdisciplinary regional group comprising of IT, architecture, strategy, and operations leaders as well as design and workflow consultants.

2.1 Human-Centered Design: Defining the Boundaries of the Care Transformation Process

A common model for adopting new technology in health care and other industries is a sequential process in which a vendor or information technology (IT) professional develops a new technological tool or system and then brings it into an organization. This sequential model may result in overinvestment in technology and to underperformance relative to its promise or expectations (MacDuffie & Krafcik, 1992) (Draca, Sadun, & Reenen, 2007). In the IT profession, this is often referred to as a "waterfall" approach to technology design and implementation.

In contrast, some organizations take a more integrated approach that builds on evidence that users and workers have, as the Japanese phrase puts it, "wisdom to give to the machines." (MacDuffie and Krafcik, 1992). Sometimes referred to in the IT literature as an "agile" approach, new technology is incorporated in an iterative fashion in response to problems or challenges defined and informed by the users of the technology. Figure 3 presents a stylized visual model of these two approaches.

[4] Beginning in 2003, KP worked with IDEO, a firm that is a globally recognized leader in human-centered design, and adapted its interdisciplinary design methodology to uncover better ways to deliver health care.

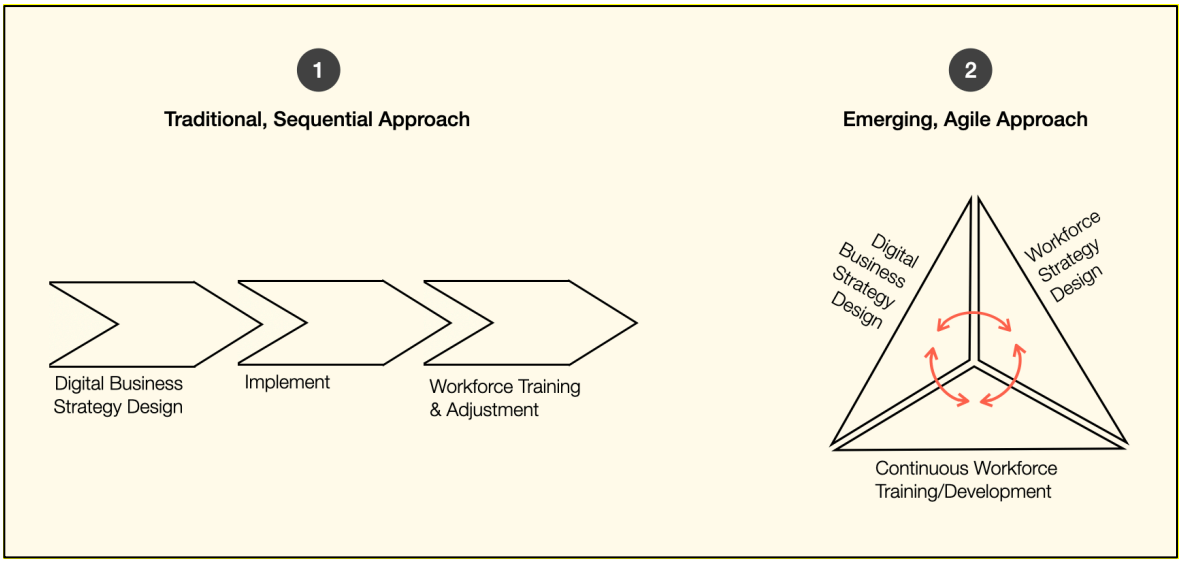

Figure 3: Two models for managing digital transformation processes (Source: Adapted from Antonis Christidis, Axel Miller, and Thomas Kochan, "Engaging the Workforce in Digital Transformation: A New Model to Enable your Digital Strategy." Mercer/Oliver Wyman.)

Health care in general, and Kaiser Permanente in particular, has experienced both approaches. The early years of introducing electronic health record (EHR) systems mostly followed the sequential approach, with large technology vendors selling their systems to health care providers. Kaiser Permanente was an early adopter of an EHR system that had been developed by Epic Corporation. An earlier study of this process reported that Kaiser Permanente spent over $5 billion dollars between 2002 and 2008 bringing the Epic system into its operations, largely as a technology alone strategy (Kochan et. al. 2009). However, gradually over time, the presence of union contract provisions requiring that employees displaced by the new technologies be provided opportunities to be retrained and redeployed to other jobs as well as a labor-management partnership that supported worker and union engagement in the implementation and training processes helped the organization learn about the benefits of a human-centered technology design approach. Such an approach incorporates employees' perspectives into the technology development process itself. (Litwin 2008).

> *"In IT we have learned that we have to be clear on what business problem we are being asked to help solve and not to just accept the vendor's product. We learned from prior experience the problems that arise when this is not done well. We've been getting much better on this in the last five years—we try to make sure of the change process up front, engage in human-centered design, have clear quality outcomes, and bring in the front line."*
>
> – Senior IT Manager, Kaiser Permanente

The process designers who launched the Care Transformation project at Kaiser Permanente recognized that the interactions of people, technology, and physical space are what enable or restrict quality care. Each had to be addressed and the goal was to view these as three interlocking parts of a system. In the Care Transformation design process, the full array of "users" was engaged in the process from the start as work systems, space, and technology designs were considered as reinforcing elements.

2.2 Design Process Uncovers Systems-Level Challenges and Opportunities

Members, physicians, operational leaders, staff from various specialties or departments, and labor union representatives formed the array of users that KPSCAL engaged early on to capture stress points and opportunities. KPSCAL observed and interviewed these users as well as captured their feedback on the existing, current generation of clinics through surveys and in-person workshops.

KPSCAL's ethnographic process revealed that a patient's journey through the current clinics was interspersed with experiences that were in tension with the goal of improving member experience. Through our own interviews with KPSCAL physicians and staff, we isolated some of these suboptimal experiences.

> *"The culture of health care is based around where the clinicians are centralized, we come to them, we deal with the appointments that they create and their schedules. They're not 24/7. They're not open on the weekends. If we can't get the services we need, we need to drive really far. We need to be in traffic. We need to park in parking. We need to wait and then go to another waiting room and then wait again. We need to deal with multiple contacts. We have very shoddy information about our visit. We can't get online…And so slowly, through patient surveys and focus groups, there was an understanding of the frustration and tremendous inconvenience with which people try to get basic clinical care."*
>
> – Zeth Ajemian, Director of KPSCAL Workforce Planning & Development (2005-17)

Upon arrival in these traditionally designed Kaiser Permanente clinics, members often encounter long check-in queues and indefinite wait times. The possibility of being called in by the physician at any time tethers members unpredictably to the waiting room; a dearth of information or updates on the wait time can be unnerving.

The lack of privacy at the nurse stations where vitals are recorded make patients feel exposed as other people pass through in the hallway.

> *"When we bring the patient into the back office and have the nurse do the work-up or vitals in the exam room, I think the patient is going to be more open and truthful, versus if they are in the back office sitting at a nurse station, not knowing who's next to them or who may be overhearing. They may not really say something that they want to say because they don't want anybody else to hear."*
>
> – Department Administrator, Torrance

Moving from one station to the next can be confusing and time-consuming. We mapped a typical patient's journey through the clinic by walking through it and observed as many as seven different touchpoints. (See Figure 4.)

> *"The nurse comes out, opens the door, yells your name, and then you go into the back. They'll vital you, and then they'll send you back out a lot of the time because the rooms aren't available [in traditionally designed clinics]."*
>
> – Department Administrator, Chino Grand

Finally, consultations with physicians can feel disengaging as physicians type their notes from behind their desktops.

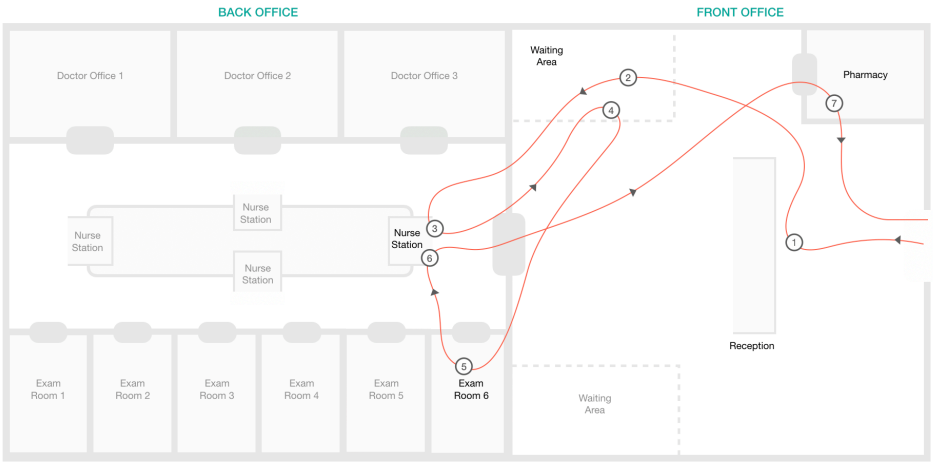

Figure 4: Mapping a typical patient's journey in a traditionally designed clinic (authors' illustration)

Physicians and other staff identified challenges that make it harder for them to perform tasks and deliver care in traditionally designed clinics. The physical layout is not conducive to interaction. Coordination of care among physicians and staff can require effort. Many personnel claimed they could go for days on end without seeing or meeting with colleagues, limiting the opportunities for informal collaboration and communications.

> "*There are walls everywhere. It's not conducive. We're siloed. Most of us will work all day and barely see one of our colleagues, because you're literally running from room to room.*"
>
> – Physician, Aliso Viejo

The burden of work varies among staff and tends to depend on the workload of the physician they are assigned to. Some staff feel that they are underutilized and not able to operate to their fullest capabilities.

> *"My feeling is that the care should be standardized and everybody should be getting the same level of care even though different physicians have different practice characteristics. Everybody really should be doing the same things ultimately. And then if your particular doctor is not there that day or that week or whatever it is, you should still be able to work with someone else."*
>
> – Physician, Aliso Viejo

As we began to examine the workflow in traditional clinics, clues emerged to explain some of the challenges patient and personnel experienced in obtaining and delivering care (See Figure 5.)

- **The buildings that house ambulatory care services are suboptimal**: KPSCAL's clinics, often large medical buildings built for other purposes before being leased out or bought by Kaiser, are tough to optimize to achieve desired patient and personnel experiences. Reception areas are often crowded, confusing, and unwelcoming. Clinical areas can have a closed layout with physician offices and exam rooms siloed off by long hallways.

  > *"Well, the building is the problem. We lease it, we didn't build it, so it's not our typical Kaiser Permanente standard of an office. This building has been extremely challenging for the multiple years we've been here...We have outgrown the building."*
  >
  > – Physician, Aliso Viejo

"Sometimes you walk into [traditional] Kaiser buildings and you're overwhelmed. There's the reception, you can see pharmacy, you can see radiology, you can see lab. It can be very overwhelming"

– Department Administrator, La Habra

"In other models [of traditionally designed clinics], you have doctor's offices, which are usually large offices, and then outside the office would be two exam rooms that are your rooms. And so, you could have your own little triangle of—go to your office and notate, then come into one room, go to the next room, then go back to your office and notate again. And then that is just multiplied over and over and over again."

– Physician, Chino Grand

- **Technological advances are underutilized and static**: The dominant technologies at play in traditionally designed clinics are EHR systems and desktop computers. All physicians have desktop computers in their offices and in each of the exam rooms. Every nurse station also has a desktop computer. Workflows can be constrained by the static positioning of technology. And, while a number of EHR applications are actively utilized, other technological innovations are not energetically applied to improve work efficiencies and quality of care.

"What used to happen [in the traditionally designed clinic] was that I would open a note in my office and then I would close it. I would pen that note. I would walk to the patient room, I would open the note in the patient room. I would document what I could. I would then close it. And then I would run back to my office as fast as I can. So, it always used to be ABC. Do you know how they say for salesmen? It's always ABC—always be closing."

– Physician, Chino Grand

- **Work systems and people practices are inflexible and unstandardized**: Key workflows revolve around the physician, and the division of labor and responsibilities are tightly defined and rarely deviated from. Also, the various departments (family medicine, behavioral health, pediatrics, optometric, etc.) tend to work in silos with little movement or sharing of staff.

"In some of the more traditional buildings, if someone's got a lot of patients to check in, they're kind of hiding in their little cubby and checking blood pressures and doing stuff. No one else is seeing that their work is time-consuming and difficult."

– Physician, Long Beach

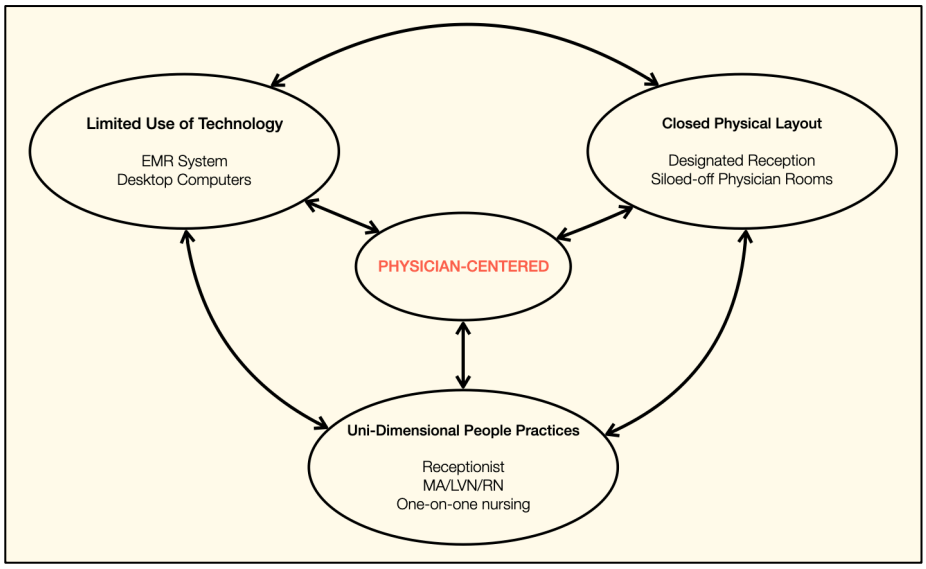

Figure 5: Physician-centered work system design in traditional KPSCAL clinics (authors' illustration)

Members' aspirations also came into view through KPSCAL's research. Members wanted more engaging, convenient, and timely services to meet their needs. They live in a world in which service is immediate, responsive, and just a click away. They had similar expectations for their health care services. The process made clear to KPSCAL that the existing ambulatory care system was tough to navigate, inconvenient, and not responsive to the realities of members' daily lives. The experiences of KPSCAL members were a far distance away from the *Care Anywhere* scenario of Leo and Rosemary Montgomery.

2.3 Patient and Personnel Needs Define Vision for Health Hub

After conducting the ethnographic research, the regional group, along with local leads representing physicians and staff from across service areas, conducted a series of workshops to translate their insights into a new vision. The vision that KPSCAL calls *Life Integration* emerged from this process. It is an ambulatory care system that is interwoven into the everyday lives of people (Lesh, Sachs, & Lee, 2013). Operationally, it consists of multiple technology-enabled touchpoints that provide improved outpatient clinical care, help members navigate various care options, and engage them in the management of their overall health through lifestyle and community-focused activities.

New *Health Hub* clinics would be a core component of *Life Integration* intended to make ambulatory care more accessible and convenient. Informed by member and personnel feedback, KPSCAL defined these goals for the new clinics:

- To introduce flexibility, efficiency, and vibrancy in the physical environment to improve workplace productivity, workplace wellness, and member experience
- To leverage technology to improve the care experience and enhance efficiency
- To foster collaboration among staff to enhance quality of care and increase efficiency.

> *"We want them, the patients and, and the staff, to walk in with a sense of expectancy: 'I can be changed for the better and I can make a difference.'"*
>
> – Physician-in-Charge, Baldwin Hills-Crenshaw

> *"There's a beautiful space, there's new technology, but at the end of the day, it's really about the people. The rest are tools that enable people. It's all about people caring for people."*
>
> – Regional Consultant and Training Coordinator

2.4 Prototyping and Testing the Health Hub Template

With the vision of Life Integration defined and the Health Hub goals formulated, KPSCAL moved to developing and testing the Health Hub template. In this phase, several ideas that had surfaced during the vision and conceptualization process—including reconfiguring physical spaces, introducing an array of technology, defining new workflows, and realigning job roles and tasks— were prototyped and tested in tandem.

The design consultants, in partnership with KP's National Facilities Services, enabled the process of redesigning the physical environment by converting a temporary warehouse into a walk-through design studio to serve as a mock-up of the new layout. This space was used for more in-depth testing with members and local staff, who provided feedback on the layout and on proposed technology and workflow changes. Regional IT personnel led the development and testing of the early versions of potential technologies.

The regional Labor Management Partnership (LMP) Workforce Planning and Development team, through its Jobs of the Future Committee, delved into the changes required in the workforce to support the Health Hubs. What roles would employees play, what tasks would they perform, and what learning and training would need to be built into this new system?

For any upcoming innovation, the Jobs of the Future Committee's work typically starts with a regional leader presenting management's strategy and vision. Subcommittees are then formed to assess the required skills in the workforce to support the strategic initiative. These subcommittees—composed of members from regional and local operations, frontline workers, labor partners, recruitment experts, and subject matter consultants—consider the roles, jobs, tasks, skills, and competencies that would support the success of the innovation. They factor in training that would be required to enhance the capabilities of the current and future workforce. They draft new or modified job descriptions, compensation changes, and training plans, which are then negotiated with each labor union. (See Figure 6.)

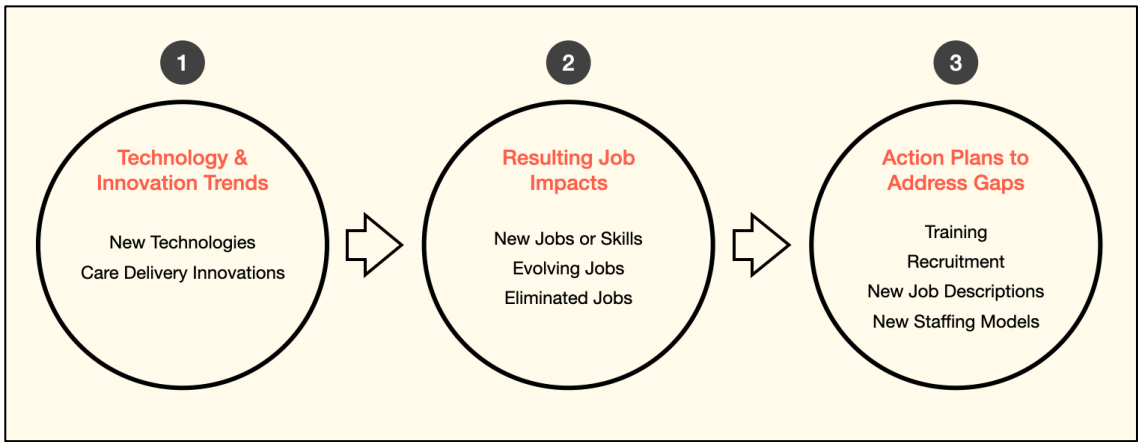

Figure 6: Working of the Jobs of the Future Committee (Source: Jobs of the Future Committee Report, 2015)

For labor, the Committee offers a window into the strategic initiatives of management, while for management, the Committee is a way to discuss and negotiate staffing support for its innovations.

> *"One, I believe that it is the right thing to do to help people move up and create mobility. The other reason is knowing that the most at-risk people to any kind of change via technology are the lowest level staff mostly…So in order to mitigate the impact of work of the future, the idea is to keep the bottom moving up."*
>
> – Donald Bradburn, Director, KPSCAL Workforce Planning and Development

The Jobs of the Future Committee focused on four workforce areas—nursing and ambulatory care, diagnostic imaging, laboratory, and reception—and developed recommendations for job redesign, training, and recruiting for each. The Committee defined three new positions that it believed should evolve from existing roles as part of the future of ambulatory care:

- **Receptionist of the future:** Identifying how technology is digitizing the appointment, check-in, and scheduling processes as well as changing patient expectations, the Committee noted that the role of the receptionist will become more mobile and evolve into a multifunctional receptionist who greets, guides, and educates members. In smaller facilities, the clinical team will also be cross-trained to assist with check-in.

- **Multifunctional worker:** The Committee also identified the need for a flexible, technologically savvy, cross-trained clinical worker performing multiple functions including back-office tasks, lab tests, blood draws, imaging, and reception. Existing staff would be trained with additional skills and certified in this new multifunctional role.

- **Patient navigator:** Finally, the merging of health care delivery inside and outside ambulatory care facilities will need clinical team members who can help members navigate care through the system and coordinate their clinical, social, and nonmedical needs.

The work systems design template also envisioned a team-based nursing model across all Health Hubs. To reinforce the overall culture of agility and nimbleness, physicians would not generally be assigned their own nursing staff in this model. Instead, each group of physicians would work with a team of nurses who interchangeably support the physicians in the group and their patients. Nurses would be cross-trained to enable them to work in a wider range of clinical departments.

Establishing these new positions proved to be more challenging and took longer than expected. Union leaders pushed for the traditional protocol of collective bargaining to negotiate any job changes. They were concerned that the multifunctional position might endanger other jobs such as lab technicians. In addition, a formal training program for these new positions did not exist.

> *"That was the one lesson I think we learned, that we probably should have had a better, more robust discussion about how that job [multifunctional worker] would get used and the pros and cons of that. We created this better-paying, multifunctional job, but never provided a training to help current employees become that."*
>
> - Donald Bradburn, Director KPSCAL Workforce Planning and Development

Kaiser Permanente's Labor Management Partnership, through its Jobs of the Future Committee, played the role of intermediary, helping establish relationships between the unions and the design and operations team. Union representatives were invited to visit mock-up testing sites that replicate the new clinics to experience how the design would work for members and employees. This helped to illuminate the value of the proposed job changes to members and employees. The process also helped to identify more broadly the skills critical for all employees now and in the future: digital fluency, customer service orientation, collaboration, and critical thinking and analytical skills. This hands-on engagement made the task of shaping these new roles and negotiating compensation and training proceed collaboratively, on the basis of shared knowledge often missing in traditional union-management relationships in the U.S.

As one of the central architects of the design process noted, engagement is critical to this type of change initiative.

> *"One of the things we learned from working with the unions while launching the multifunctional role in Manhattan Beach was that you can never be too early engaging with the unions, that it always takes longer than expected when unions are involved."*
>
> – Amanda Hauser DeHaven, SC Regional Director of Strategic Projects

The design process (as illustrated in Figure 7) culminated in the opening of KPSCAL's first Health Hub, Manhattan Beach, in 2015. At the time of our field work in 2019, eighteen Health Hubs were in place. In the next section we trace the process from design through launch and initial years of operation.

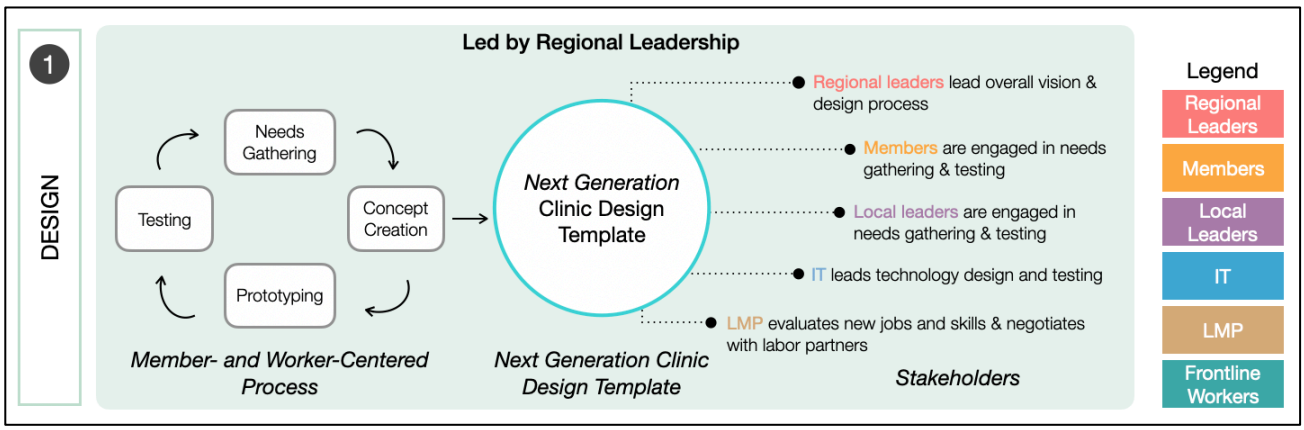

Figure 7: Steps and stakeholders involved during the design phase of the Care Transformation project (authors' illustration)

3 ROLLING OUT THE HEALTH HUBS

> **"Kaiser Permanente opens first of community Health Hubs**
> New clinics offer care and wellness education in attractively designed facilities
>
> *….The health system's new 8,000-square-foot clinic in Manhattan Beach in Los Angeles County is the first to open as construction continues or starts on nine other sites. HDR Inc. designed the first of the facilities.*
>
> *The new facility offers a warm and welcoming design that starts with a waiting room featuring natural light, wood furnishings and live plants. To make the experience more efficient, patients have the option of checking in by either using a kiosk or seeing the service representative. A text message alerts patient when their doctors are ready to see them, giving them freedom to move about until that time."*[5]
>
> – Jeff Ferenc, ASHE *Health Facilities Management*, May 2016

As we entered the *Public Square* waiting area at the La Habra Health Hub, we encountered an open and inviting layout—bright colors, artwork on the walls, and moveable furniture to create micro-settings. There were places to get coffee and plug in electronic devices as well as places to unplug, with nooks for families with young children, complete with books and toys.

We were struck by the absence of chaos in this vibrant, high-tech setting. We were greeted with a warm smile by a *Service Representative*, the new position, similar to a hotel concierge, developed to assist people as they move through the La Habra experience. One patient might not be comfortable with self-check-in, another may not understand how to read the monitor. The Service Representative was there to ease stress, to do whatever was needed to make it all work for the patient.

We observed doctors and nurses moving energetically in the clinical spaces, laptops in hand, connecting with each other spontaneously but purposefully. Color-coded digital dashboards were in plain view and actively used, signaling the real-time status of patient flows—e.g., patient in waiting room, patient in exam room, patient with doctor.

La Habra, which opened in August 2017, is one of six Health Hubs we visited. We explored the steps that followed the design process through the opening and initial years of operation of these clinics, as local leadership moved to the forefront of the implementation process and regional leaders shifted to a more of a support role. (See Figure 8.)

[5] Quote pulled from a magazine article: https://www.hfmmagazine.com/articles/2197-kaiser-permanente-opens-first-of-community-health-hubs

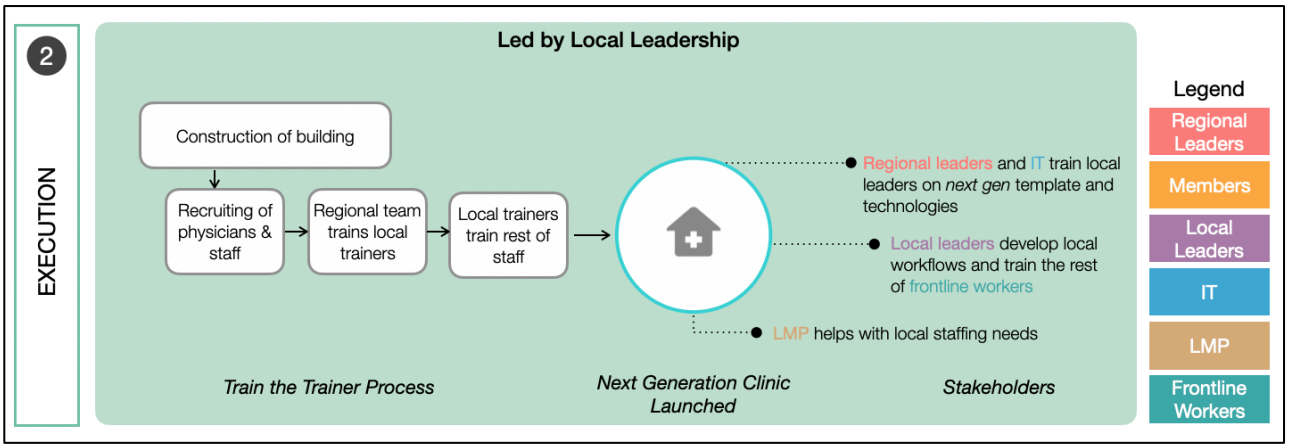

Figure 8: Steps and stakeholders involved during the launch phase of the Care Transformation project (authors' illustration)

3.1 Construction of the Building

The journey from the initial design template to opening a Health Hub involves several steps. The process begins with the regional and service area strategy teams assessing the business case for a clinic, including the range of ambulatory services that are needed and offered in a neighborhood. This establishes the overall configuration of the Health Hub, based on which KP's National Facilities Services team generates the initial schematic design for the new clinic. The architectural and space designs of the Health Hubs vary in size, but most are relatively small outpatient buildings built from the ground up to keep cost per square footage low. Here, the common Health Hub design template may be customized on the margins. Health Hubs typically spawn from existing clinics—where either an existing clinic splits into a sub-clinic in a new neighborhood or an entire clinic closes and transitions to a new building in the same neighborhood.

The next step is to form a local leadership group who will help to shape the overall configurations within the constraints of the overarching design template. The local leadership groups are drawn from existing clinics. Members include a physician-in-charge (PIC), a department administrator (DA), and other functional chiefs who will handle the different departments of the new clinic. The leadership group members have experience working together and share a common vision for the new Health Hub. The local groups solidify the vision and aspirational qualities of their own Health Hubs, building on the regional Health Hub goals.

> *"Yeah, I was involved in the early planning… [The Department Administrator] and I were invited to be part of this team… we both had the same kind of idea. We had the same value system and so we wanted to make sure that we kind of take the culture and bring it over here and kind of improve on that."*
>
> – Physician-in-Charge, La Habra

Construction begins on the finalized design 12-18 months prior to opening. The National Facilities Services team seeks input from the local group on the initial schematic design, especially on interior design, equipment placement, and furnishings. Health Hub space configurations, for example, reduce the size of a physician's office to less than half of that in a traditional clinic. Other staff members no longer have their own dedicated working space. This

proved to be a big challenge. Involving the team in mock-ups and prototyping enabled them to contribute to the final space plan.

3.2 Staffing

Staffing is a critical early step. The process begins 6-8 months prior to opening a new Health Hub clinic to allow staff to participate in a range of decisions and training sessions. Existing clinics spawn the new Health Hubs, drawing on personnel who are sympathetic to the approach. Personnel from the "parent" clinic volunteer to move to the new location. The new Health Hub's physician-in-charge and department administrator have the flexibility to curate their team, searching for volunteers best suited to the Hub's desired culture and its staffing requirements. In some cases, an entire clinic might make the transition to the new Health Hub model, involving all of its personnel in the changed approach.

Agreements with the LMP facilitate these voluntary staff transfers. The department administrator and physician-in-charge start the process by sharing information about the Health Hub—its vision and overarching approach—among staff at their current clinic. Labor partners are involved, assisting the management team for the new clinic in hiring and in helping to allay the fears that are inevitable in transitions.

> *"As we invited other physicians and invited staff members, we kind of were lucky in some ways because we had some leverage as to who we could invite to come over here. It was really important for me to invite physicians who are more accepting of technology and who are more adaptable to changes, rather than inviting people who are really resistant to change or who are late adopters of technology."*
>
> – Physician-in-Charge, La Habra

New jobs and roles developed by the regional LMP Jobs of the Future Committee in the earlier phase are incorporated into the staffing strategy. Existing employees are prepared to take on new roles. Service representatives replace the traditional receptionists, moving more proactively to greet and support members. Multifunctional workers—licensed medical assistants (MAs) and licensed vocational nurses (LVNs)—are cross-trained to take on a range of tasks, such as drawing blood, taking X-rays and checking in patients. Hub personnel also undergo additional training in working alongside technology and in communication, teamwork, and problem-solving skills.

> *"I really dislike practicing from the top down. You know: I'm the physician, you're working for me, you're my staff, you do everything I want you to do—I don't like that. I don't like working in that kind of hierarchal pattern. It's more of a level field where we're all valued, we all are important. That was the type of atmosphere I was searching for. Coming here or working with my department administrator, we were able to kind of create a culture like that…"*
>
> – Physician-in-Charge, La Habra

3.3 Train-the-Trainer and Launch Processes

The next step is to train the recruited personnel on the Health Hub design, workflows, and technologies. KPSCAL follows a train-the-trainer approach to accomplish this. A team of "super users" or master trainers—consisting of local physicians, staff, and technicians who either volunteer or are identified by the department administrator and physician-in-charge—are selected for the initial kick-off. The team is then trained by the regional team at KPSCAL's training and innovation center in Southern California, which houses a mock-up of a Health Hub

clinic. In a full-day program, the master trainers immerse themselves in each component of the design template to become acquainted with physical layout, new technologies, and planned workflows. The regional team records initial input from the local leaders regarding adjustments that may be needed. The template has built-in flexibility for adjustments while it also defines and contains the scope of changes.

The one-day kick-off meeting is followed by a series of localized meetings among the master trainers who delve into each aspect of the Health Hub, keeping in mind the needs of their members and personnel. Workflows incorporating the new technologies are discussed and decisions about the nursing model (one-on-one or team-based), personnel schedules, and job roles (cross-training, new positions) are made.

A few weeks later, the master trainers come together for a final in-depth three-day workshop. This workshop allows master trainers to practice the clinical workflows in a simulated environment, adjusting and finalizing protocols. Personnel play the role of patients, replicating the entire clinic journey from a patient's perspective, from entry to exit. IT and workflow consultants closely observe the simulation, providing feedback for improvement while recording operational concerns and challenges. The output is finalized with workflows and processes tailored to the preferences of the local clinic personnel.

When the clinic's construction is complete, the master trainers begin the training process with the full staff on-site. In this multiday event, the staff test and practice the new workflow protocols, learn the technology, and become familiar with their new space.

> *"They brought us over for a day or two to specifically work on learning about the dashboard [used to display patient wait times and other information], how to use it, when to use it. And we were all brought together so that we could figure out as a group what we wanted to use those colors for and talk about how we wanted the workflow to go before everything started."*
>
> – Physician, Chino Grand

This training process builds confidence and familiarity with technology and processes. The engagement of frontline staff as master trainers and early adopters during implementation drives a sense of co-ownership.

3.4 Health Hubs in Operation

Health Hubs are distinct in their physical appearance. They are inviting at the street level, with plantings and walkways guiding people to their well-marked entryways. Traditional receptionists and reception desks are replaced by roaming service representatives holding portable tablets—reminiscent of an Apple store—and self-check-in kiosks. In the waiting areas, the furniture configuration is adjustable and there are designated workstations where members can plug in devices as they wait.

> *"It's beautiful, in design. When you look at the clinic, the first thought that you have is "Is this a hospital?" When you walk up on it, and in it, you see how healing it is. It has a healing perspective, a health perspective, a thriving perspective. Something's going on in there, a vibrancy is there. And that was intended."*
>
> – Physician-in-Charge, Baldwin Hills-Crenshaw

The staff offices and clinical space, referred to as the back office, have fewer hallways and more visible lines of sight that traditional clinics, in order to facilitate quick and easy collaboration among staff. The clinical floor is an open layout with touchdown stations that allow staff to huddle together and to enter notes without having to return to offices. (See Figure 9.) Laptops or tablets enable workers to move freely around the clinic. A private lounge for physicians secured from the clinical floor allows physicians to work and mingle in a relaxing environment.

> *"The way the building is structured is very open. We, physicians in general, spend very little time actually in our offices here. We spend most of our day outside either in exam rooms or in the shared working area where we work with the nurses and other doctors…I'd say it's a more dynamic environment where you just sort of interact with people a lot."*
>
> – Physician, Signal Hill

Technology is visible and well-integrated into everyday workflows. Multiple kiosks at the clinic entrance allow members to self-check-in. The waiting rooms and clinical floor are equipped with huge interactive screens called dashboards that display member wait times and location information, facilitating staff coordination while reducing member anxiety.

The shift from desktop to laptop devices enables physicians and staff members to access the EHR system from anywhere at any time. A Microsoft Teams instant messaging platform makes it easier for staff to coordinate care or interact with one another.

In the exam room, a digital chair weighs members while they are sitting down and a wall monitor mirrors the physician's screen, allowing the physician to share notes or lab or X-ray results with the member.

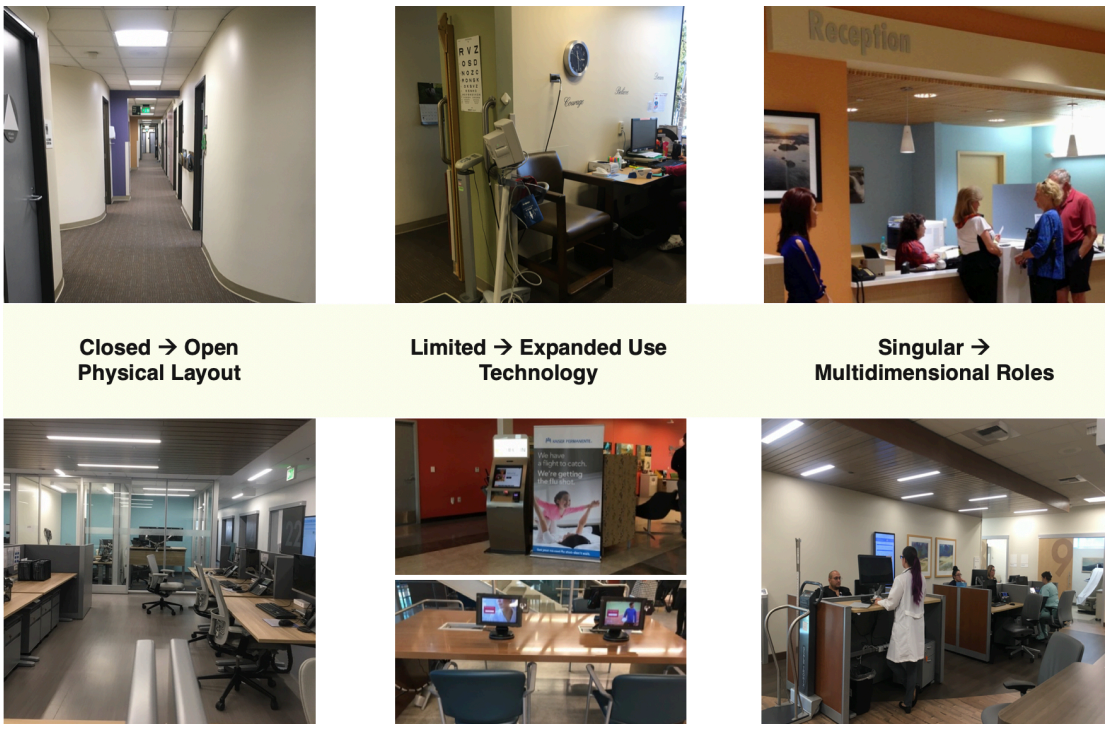

Figure 9: From traditional ambulatory clinics (row 1) to Health Hubs (row 2)

During our visits to these Health Hubs we observed numerous examples of small innovations primarily introduced by frontline staff and local leaders. For instance, in the La Habra clinic, nurses developed a simple tool that made it possible to measure the height of patients as they walk into the exam room: the staff installed a height scale on the doorjamb. In the Manhattan Beach clinic, the department administrator developed a way to monitor individual staff accountability within a team, a limitation of the team-based nursing model that we consistently heard about across clinics.

> *"Three words I would use to describe this clinic are innovative, high-tech, and future."*
>
> – Service Representative, Manhattan Beach

3.5 Stakeholder Perspectives on Health Hubs

We attempted to capture patient and personnel satisfaction with the new design and operations in our observations. We assessed stakeholder satisfaction anecdotally by interviewing a number of physicians and staff across roles, departments, and clinics, recording what they liked and what they didn't. We looked for specific examples that illustrate stakeholder feedback and experiences. Although we could not directly interview patients, we replicated a typical journey by walking through the Health Hub clinics, observing the different touchpoints.

A patient's journey through a Health Hub is streamlined, intuitive, and personalized. At check-in, a service representative welcomes and greets the member, either checking them in or directing them to one of several self-check-in kiosks based on their preference. Smaller or no check-in lines make this step quick and easy.

> *"It's more efficient because of the way the model is set up. You have various ways of check-in, you have service reps with different functions: you have service reps that are behind the desk, but you also have service reps that are greeting you, service reps that are making sure that you've been checked in."*
>
> – Service Representative, Baldwin Hills-Crenshaw

In the waiting areas (called Public Squares), huge dashboards display real-time information on wait times. Instead of sitting in the waiting room, members can opt to be notified when their turn has come. More information and flexibility to move around make waiting less stressful.

> *"Our patient dashboard will tell them exactly at a certain time you need to go up on the second floor and wait in the waiting area. So, it's very efficient because it's informational where everybody knows exactly where they should be at a certain time or if staff need them, they know where to find them."*
>
> – Licensed Vocational Nurse (LVN), Chino Grand

> *"They like the fact that they can just be sent a text when they're ready to be seen."*
>
> – Physician, Chino Grand

> *"There was this thinking in creating these Public Squares, that you want people actively waiting. You don't want people up in a waiting room feeling like they're in a box staring at each other, just waiting for somebody to open the door and call them. As much as you can, have members engage with other activities and their health. They'll see value in that time that they're spending before going to see the doctor."*
>
> – Department Administrator, Baldwin Hills-Crenshaw

In the clinical area, all interactions with the clinical team take place in an exam room equipped with state-of-the art technology such as video screens, digital chairs, and automatic kits to

record vitals. A one-stop shop for patients in the back office ensures convenience, privacy, and safety. Mapping a patient's journey through the Health Hub, we found fewer touchpoints than in a traditional clinic. (See Figure 10.)

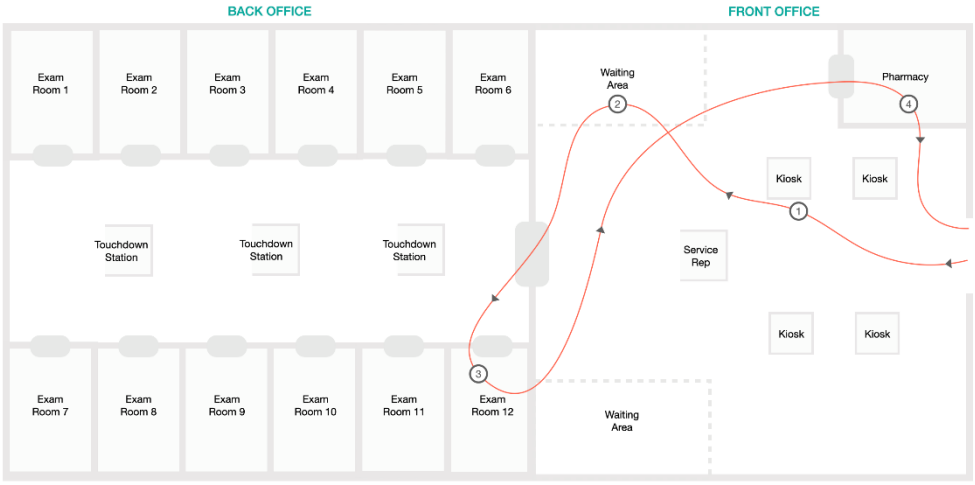

Figure 10: Mapping a typical patient's journey in a Health Hub: four touchpoints (authors' illustration)

> *"The patients, when they're brought back into the office, they're taken straight into an exam room. All their vital signs are taken in the room. All their history is taken in the room, so there's a lot more privacy there from their standpoint. There are not a lot of random people, patients walking around the area, that might disturb their privacy, because they basically get escorted straight into a room. Then when they leave, they go straight through the doors. From that standpoint, it lends to, I think, some greater privacy for our patients, which was important."*
>
> – Physician, Chino Grand

> *"There are so many of my patients, they always say, "Oh, you guys aren't so busy." And, I kind of chuckle because I'm like, we are really busy. I think the design of the building makes it seem like it's not busy. The flow of traffic isn't seen so much by the patients. So, I think that helps a lot because then it puts people at ease. It's more of a calming environment. So yeah, I think they really like that."*
>
> – Multifunctional LVN, La Habra

> *"The chair scales, to me, are phenomenal because if you have an elderly patient that cannot step up on a traditional scale, all we have to do is basically get them from the wheelchair if they're in a wheelchair, transition them to the digital chair, and then they are there for the remainder of their appointment until they are ready to leave."*
>
> – Medical Assistant (MA), La Habra

Additional tests such as blood draws or X-ray tests can also be administered in some Health Hub clinics that have multifunctional MAs or LVNs. From a quality of care standpoint, this is especially beneficial for patients who tend to skip their recommended tests when asked to go to a different floor for tests.

> *"I think it's [the multifunctional LVN position] about giving the patient the ultimate experience—from me intaking them while they're doing their vital signs to discharging them. I can go into the room, give them their vaccines, draw their blood, do their X-rays, and then they're pretty much good to go. Whereas in other facilities, you come into the provider's office, doctor orders labs, X-rays, injections. So, you see a nurse for injections, you see a lab tech for the labs. You see the X-ray tech for X-rays. Here, they see me*

> *throughout the whole interaction, which patients appreciate, and they enjoy because you don't have to jump around hoops to go where you need to go."*
>
> – Multifunctional LVN, Manhattan Beach

During physician consultations, members are able to view the physician's notes or results of their tests on the wall screen together with the physician. This makes the interaction more engaging and collaborative.

> *"And it's just the patients are in awe. They're like, oh that's so neat that they can just see their results there or see their growth chart up on the board. I mean, it's a little thing, but to them, they've never seen that before and that makes it intriguing and an interesting point in their visit."*
>
> – Physician, Chino Grand

Outside of their clinical visit, members at some of the Health Hubs also have the option to sign up for health wellness classes that are offered at the clinic.

> *"For me, it's different because my concept here [at the Health Hub] is total quality. I don't know if that's a good description, but the reason why I say that is because we offer different classes here, there's line dancing, there's Zumba, they do fitness Fridays here. They're doing things, and I feel like that's good for the community, because for people that don't have money, they can actually come here, and they can take a fitness class, they could do a cooking class. Versus West LA, those things weren't really offered, it was just like, 'Come get your health care and then you leave.'"*
>
> – LVN, Baldwin Hills-Crenshaw

Personnel in Health Hubs shared the characteristics of the new clinic, workflows, and culture that help them perform better. Some also shared their concerns or wishes for further improvement.

The open physical layout of a Health Hub allows workers to huddle together and better collaborate with each other. One physician described how, in the new clinic, an administrative question that might have taken days to address was instead resolved in less than a minute, thanks to the ability to interact informally with a colleague in a space that facilitates collaboration.

Open physical layout may also add to the stress levels of some workers. In traditional ambulatory clinics, the walled-off cubicles can provide a brief respite for staff in the middle of their workday. Being constantly visible to co-workers and managers can be stressful for certain workers.

> *"Here, you're out in the open. So you need extra engagement, extra passion for each work you do, extra connection, extra communication."*
>
> – Department Administrator, La Habra

Laptops or tablets lend mobility to workers who are now able to move freely around the clinic and be more efficient in their work. These portable devices also make it easier to use other communication technologies such as an instant messaging platform (Microsoft Teams) that further improves coordination.

> *"Being able to just carry your own laptop around definitely makes things a lot easier. I mean, you save time just from not having to reenter your password every visit to get logged back into Health Connect. It's there already. And then it's also nice, like if sometimes I don't*

> *finish my work and I have to take it home, I could just take my laptop home and work from there. I also just feel like there's less issues with space and clutter in a room with a laptop."*
>
> – Physician, Chino Grand

> *"I feel like the technology that was given to us here has really augmented the way I kind of practice. I feel like it has made communication between physicians, between other nurses, a lot easier. We may be separated by three floors, but it really doesn't feel like it, because of the Teams communication platform. Seeing where everyone is on a dashboard, an eyeball, if you will, of where everyone is, at what time is helpful."*
>
> – Registered Nurse, La Habra

Dashboards offer a convenient way to standardize and manage workflows, making them more efficient. They also encourage clinics to follow team-based workflows.

> *"The dashboard, it really helps, we can estimate times, figure out where the doctor is, figure out where the nurse is. That alone provides communication. Because if you can't find a nurse, you don't know where she's at, you see the board, it's orange, "Oh, she's in that room giving shots." I feel like it makes the workflow better."*
>
> – LVN, Baldwin Hills-Crenshaw

> *"The dashboards here in the back have been very useful for the physicians and the staff to be able to assess: how busy is everyone? Is everyone running behind? Are they ahead? Do people, does one doctor need help? Does one of the nurses need help with a case because they're running behind? You can see it on the dashboard, who might need a little bit of some assistance to kind of keep things flowing."*
>
> – Physician, Chino Grand

Some of the Health Hub technologies also enable workers to interact or communicate with members in myriad and more prompt ways. For instance, service representatives use their tablets to approach and help members during check-in, the back-office staff let members know of their wait times via dashboard and text notifications, and physicians are quickly able to educate members via videos on the exam room screens.

> *One of the bigger things I foresee being a bonus [of using the new technology tools] is transparency. I'm a very big believer in transparency with patients. I think there should really never be anything in a patient's chart that they're not aware of. I know people learn things in different ways. Some people are visual learners. I think seeing it [notes on a wall screen], I think will benefit the patient and probably make compliance to the medical recommendations higher. That would be my suspicion.*
>
> – Physician, Aliso Viejo

> *It [the exam room screen] can be used as an explanatory tool to actually give more insight into problems. And that's fantastic because you know what I don't have to do, I don't have to carry all these models around anymore. I had a model of the hip, I had a model of the knee, I had a model of the foot and I literally, I brought one model of the ear and I have two pictures of the ear on my desktop. I have not used that model. And now I'm like thinking maybe I should go put that back in Rancho where I was because I have not touched that model since.*
>
> – Physician, Chino Grand

There is variability in technology usage within and among Health Hubs—for instance, while some doctors like to use exam room screens during consultation to share notes and answer questions, others do not prefer it as much. Similarly, while in some clinics, check-in kiosks mostly lay idle, in others, it forms an important part of the check-in process.

The physical layout (open clinical floor and private lounge), mobility, and team-based workflows foster collegiality and interdependence among the staff. (See Figure 11.)

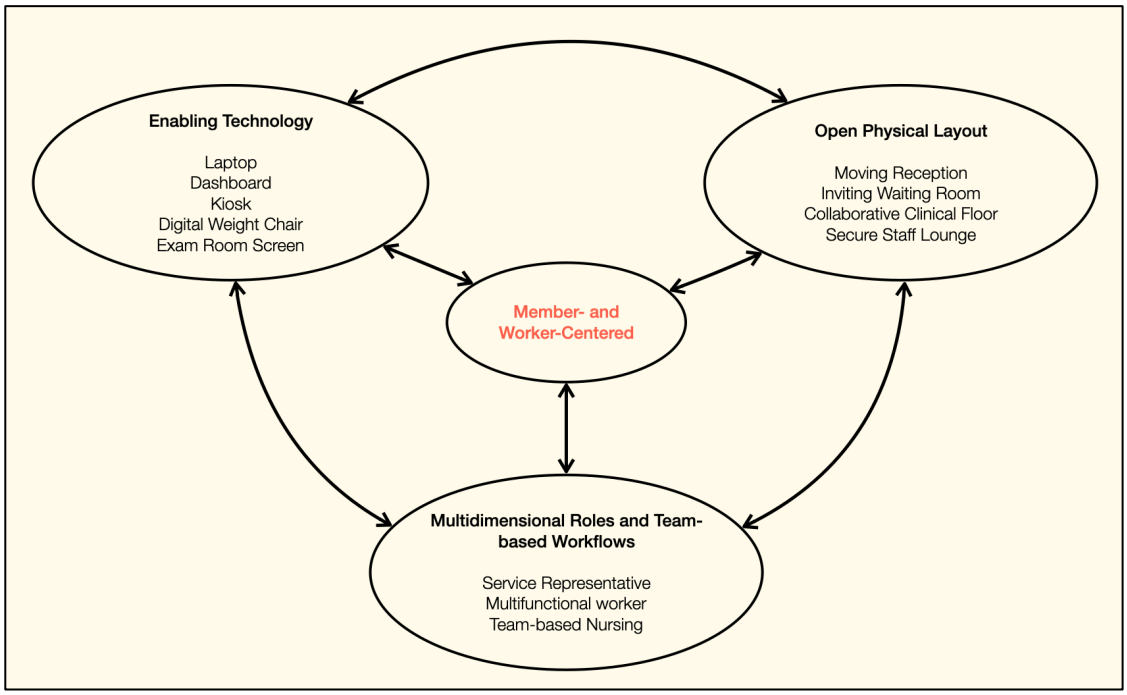

Figure 11: Member- and worker-centered work system design in KPSCAL Health Hub clinics (authors' illustration)

> *"I think the difference here from my previous job is that it may be chaotic, but it also, in a sense, runs very smoothly. We are very busy here, but our system is so well developed that even though it's very busy, we do our jobs very well and we get it done and our patients don't see how busy we are because it seems very calm. We're all very friendly. So, I think that's the difference. It's like a well-oiled machine. Everyone does the same things. There's a standard."*
>
> – Multifunctional LVN, La Habra

> *"I'm hopeful that by building a more collegial atmosphere, people will be more willing to work at a higher level and own the issues that arise so they're taking care of at that visit or whatever the interaction is. Even if it's a message that comes through an electronic medical record that it's taken care of and put to rest and doesn't become a prolonged issue. I think that's another vision for the building is to improve efficiency through collegiality."*
>
> – Physician, Aliso Viejo

> *"I very much have the feeling that if I'm working hard, even if I'm questionably overworked. I look around and I see all my colleagues working hard too. I don't burn out. I don't dump things on other physicians. I don't turn patients away. I'm happier as a human being. I am frankly working at a higher efficiency. I think for me the whole culture of teamwork and collegiality I think really just promotes increased efficiency."*
>
> – Physician, Aliso Viejo

Team-based nursing helps in facilitating collaboration, standardizing workflows, and distributing work uniformly among the staff. However, it represents a big shift for physicians and staff who throughout their careers were accustomed to a one-on-one nursing configuration. The approach may not be ideal for certain specialties, such as pediatrics, where patients form trusted

relationships with their physician's nurse. Team-based nursing can also pose a challenge for accountability—everyone and no one is responsible.

The team-based model worked for some of the Health Hubs and not others. At the Chino Grand clinic, after several rounds of testing the team-based approach, the clinic's management team decided to go with the one-on-one nursing model because it was better suited to the clinic's needs. The template is flexible. The personnel at these Health Hubs are encouraged to test approaches but they also have the option to reject them. The key is that they maintain an eye on the larger goals and that the work systems work for staff in service of these goals.

> *"A part of Next-Gen [Health Hubs] is that really you don't own your space. This is why everybody has to train wherever you are. Doctors no longer have their one-to-one nurse or back office staff. We are supported by modules [departments]. So whatever module you're working in, it is that module you're taking care of."*
>
> – Department Administrator, Porter Ranch

> *"Just the atmosphere, it's very positive. To me it doesn't feel like a stressful workplace. Time always flies by so fast and everybody comes together as a team. If we see that someone is backed up, we'll start working up the next patient, have them roomed, so that it doesn't create much stress on anyone."*
>
> – MA, Aliso Viejo

> *"I feel knowing that my co-worker is going to discharge my next patient or grab the next patient, I'm able to take my time. Take maybe the extra minute or two with the patient, whether it's just listening to them tell me a story or making sure I'm not rushing, basically. Knowing that the next patient's going to be taken care of, I feel, helps out a lot."*
>
> – Multifunctional LVN, La Habra

Cross-training or rotation of the staff among different departments can be both favorable and challenging for the staff.

> *"You get to work with more doctors. So, you learn more, because you're not just with one person, you're not just by yourself, you're actually as a team, so you really get to share best practices, is what we call it. It helped out a lot in the quality of the care that we bring to the patients."*
>
> – LVN, Porter Ranch

> *"One of the things that I think, too, inherently, this technology and the blueprint has done is, because we're now asking the LVNs to work at the top of their license and now we're asking the RNs to work at the top of their license, there's inherently more job satisfaction. When people are happier, they do better at their job."*
>
> – Physician, Chino Grand

Multifunctional workers feel empowered since they are able to use all of their certifications.

> *"I do believe that [a] multifunction worker will be an amazing addition to our team. I know that I believe we're slotted to have one or they're working towards having this, [be]cause they're using it La Habra right now, and it's working very, very well. And I think again that goes to, it's not that we want to take anyone's job, it's more of that it's already in this person's scope of practice and they're, this person could be a support to multiple departments rather than just being in one service line supporting that."*
>
> – Department Administrator, Chino Grand

> *"What got me excited was I was able to utilize all my skills all in one facility. It's very unique. It's even unique to have the job titles I do have as an LVN with X-ray."*
>
> – Multifunctional LVN, Manhattan Beach

Service representatives reported feeling happier about their new role as it allows them to move around and interact more freely with the members.

> *"It [the evolution from receptionist to service representative] was very interesting. It depends on the type of person that you are. If you are resistant to change, it can be shocking or a little too much. But if you are not resistant to change, it's definitely an exciting venture to do something different and new. What I appreciated about the change is the fact that earlier we were so stagnant, we were so stationary, but now we are able to move around. It makes the connection with your members, I think, a little bit better, more personable."*
>
> – Service Representative, Baldwin Hills-Crenshaw

Some workers also expressed skepticism. They felt that despite the expanded use of technologies, the quality of care delivered would remain the same.

> *"I really don't know how things will improve [in Health Hubs] because I personally think regardless of what they do, it's going to be the same thing. The doctor's going to have to make the right diagnosis, do the exam, and you're going to have to code the same thing to get paid. So, I really don't know how that's going to really improve. It's just going to look more modern, more glitzy."*
>
> – Physician, Aliso Viejo

Others, especially older staff, shared how they are not very passionate about changing their way of practicing, or their concerns that technology may impede personal bonding or hinder some patients from accessing care.

> *"I feel like a lot of the younger physicians who are tech savvy, they usually are very positive about it [Health Hub clinics]. But some of the providers who have been here for a while or they're just used to using this traditional way, they are somewhat skeptical. Not skeptical of the system, about getting retrained into using the new system."*
>
> – Physician, Rancho Cucamonga

> *"How we talk about it here is, technology is there. It's there to help you and assist in the communication, but it doesn't beat the face-to-face communication, and the way you're going to speak to patients, and to your co-workers, and work together."*
>
> – LVN, Porter Ranch

> *"A lot of our older populations are very confused by the technology, and sometimes it's very frustrating to them. In my opinion, I think that we still need to keep a very integrated mix of traditional and [the new clinics], so that we can provide quality service to all because that may be defined differently depending on whomever you're talking to."*
>
> – Department Administrator, Torrance

For some staff, the primary attraction of a Health Hub has nothing to do with improved care but that it is closer to where they live.

> *"I haven't heard a lot from the staff about one way or the other. Like, 'Oh I really want to go there, because they have the dashboard.' I think they pretty much say, 'Where is that clinic located in terms of my home? What are the hours I can get there?', and those are probably going to be some of the primary things that they look for."*
>
> – Physician, Rancho Cucamonga

The engagement that was evident in the initial design and development process is secured through both formal and informal structures—from spontaneous discussions to unit-based teams. These help to reinforce habits of developing and testing ideas in a culture of innovation, post-opening. (See Figure 12.)

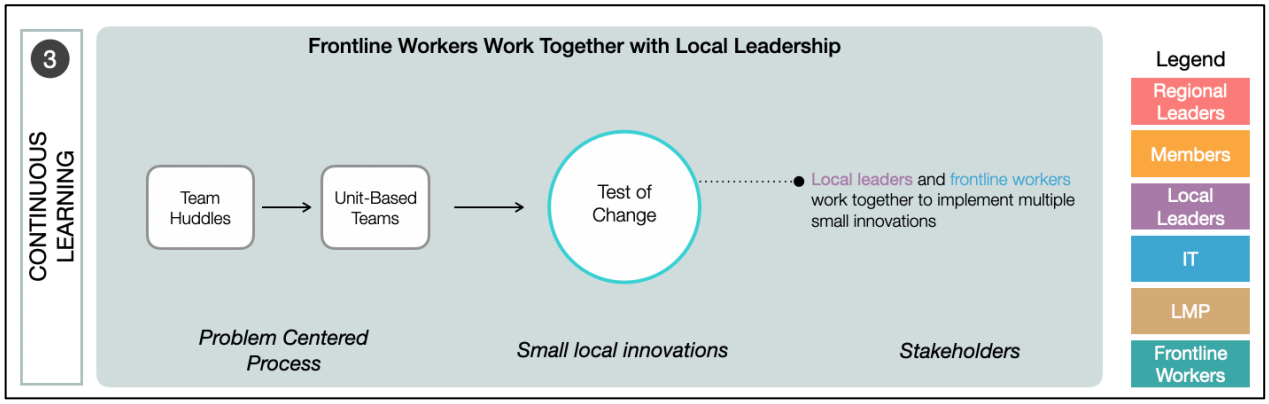

Figure 12: Ongoing involvement of workers after Health Hub opens (authors' illustration)

4 OBSERVATIONS AND DISCUSSION

The Health Hubs employ technological advancements throughout their operations. However, one characteristic we observed during our visits to the Health Hub clinics that stands out was the proclivity of personnel to innovate at every level—with work systems, space design, and technology. These final insights from our fieldwork may help explain how and why.

A culture of engagement, a trusted structure, and a catalytic opportunity were important prerequisites. A culture of innovation and worker engagement, reinforced by the KP structure and the labor-management partnership, predates the Care Transformation project. We identified five "preexisting conditions" that provided KPSCAL not only the freedom to move forward with the Care Transformation project, but also the confidence and competence to execute the process in an environment of trust.

- **Reinforcing labor-management partnership**: The presence of a strong labor-management partnership and foundational contract language provided a basis for constructive worker engagement and protection.
- **Enabling organizational model**: A capitated business model and a decentralized regional system enabled KPSCAL to operate with autonomy and maintain a sharp focus on the central goal of improving member experience.
- **Focus on members**: The focus on members is not a new idea at Kaiser. The LMP articulates its mission—providing the best quality care at an affordable price—in what they refer to as their *value compass,* which places members at the center. (See Figure 13.)
- **Prior experience with human-centered design**: In 2003, working with the design firm IDEO, KP's Garfield Innovation Center began formulating a creative problem-solving approach. By the start of KPSCAL's Care Transformation project, KP had experience with this process.
- **Catalytic opportunity to build new clinics**: A 2012 strategic plan to build new ambulatory clinics in underserved communities closer to people's homes offered KPSCAL two choices: build new buildings or reimagine ambulatory care. They chose the latter.

Figure 13: Labor Management Partnership value compass

Early and ongoing engagement of unions and critical stakeholders improves the quality of design and effectiveness throughout implementation. In order for the needs and preferences of members and personnel to help drive systems-level innovations, these stakeholders must be engaged early in a structured way. Formal organizational structures—such as the Labor Management Partnership (LMP), Jobs of the Future Committee, and jointly funded education and training programs—were involved in the process from the start, along with a vast array of other critical players. Beginning first with defining the opportunities and unmet

needs, these players were actively engaged in the design, testing, and subsequent rollout of the Health Hubs. Early and ongoing involvement reinforced a shared commitment to success as labor representatives supported the growth and development of the workers that transitioned to Health Hubs.

An operational shift from physician-centered and siloed to member-centered and team-based opened creative paths toward work and technology systems redesign. With an overarching goal of improving KP member experience, KPSCAL Health Hubs depart from the traditional physician-centered practice of ambulatory care. An emphasis on teamwork, problem-solving, initiative-taking, and information-sharing requires physicians and staff to collaborate and interact with one another. Improved technology, space design, and work practices support this in a variety of ways.

Technology and space design enabled a fundamental flip in mobility, improving efficiency and enhancing teamwork. Technology from laptops to monitors and kiosks support a shift from interactions anchored in physician's offices to interactions occurring everywhere. In technologically enabled exam rooms, members receive services in one place as physicians and staff move to them as opposed to a more traditional setting where patients move from service to service. Space design is open, allowing easy movement, and line-of-sight connections reinforce frequent staff encounters and aid communication flow. Laptops allow the staff to collaborate in the moment in the open clinical layout. Lounges for physicians and staff enhance connection while dashboards over the sofas provide real-time details on patient flow. Collaboration becomes the operational norm, reinforced by technology and space design.

We observed workers exhibiting a high degree of confidence with technology. While this confidence could be a result of the personnel selection process, we posit that it derives from a combination of additional factors. Job security plays a role. Collective bargaining agreements protect personnel from being displaced. Moreover, technology is intended to augment their capabilities, not replace them. Ample training and tech support, as IT personnel work arm-in-arm with clinical staff, also may contribute to confidence.

New technology may leave some workers behind. Many workers are attracted to the Health Hubs' state-of-the-art technology, although it might not be the primary reason for their transition. The opt-in selection process for employees, however, may tilt toward those who are already adept with technology. There should be additional technology training for the less savvy as well as safety mechanisms that enable them to either remain or transition to a more preferred work setting.

> *"To be honest, the only thing I would change, really, is would be to give an option to the staff of, if they wanted to switch over to a different area, because some people have tried this and don't like it. And, they're miserable, they hate it, and some people love it. So, there's not really a whole lot in between."*
>
> – LVN, Porter Ranch

Physical spaces were strategically designed to support member and worker goals, but there are trade-offs. Health Hubs are conspicuously different from the traditional clinics. The design of the new buildings reflects a deliberate desire to support goals of improved member experience and personnel teamwork, efficiency, and overall satisfaction. The space plan can be customized within a standard template. In addition, local personnel are able to customize the

décor as they choose and arrange furniture, wall colors and art, making it their own. However, there are also challenges. The open design represents a shift from "my space" to "our space," and this is not just an aesthetic change. The open space design influences work arrangements and is enabled by technology, and it does not work for everyone.

Striking a balance between security and risk-taking drove worker acceptance. KPSCAL adopted deliberate measures to ensure the safety and development of its workers as it challenged them to take risks to pioneer a new model. This is a case of collaborative and inclusive technological innovation in which workers take on new tasks as technology advances rather than being left behind. The LMP's Jobs of the Future Committee provided a neutral platform for labor and management to discuss the vision of Health Hubs and impact on the workforce. Early involvement of the various unions and labor representatives helped in getting them on board to support the bigger vision. Unit-based teams allow local leaders to run experiments in collaboration with the staff post-opening. There is job security for changing job roles.

Workforce growth and development is an ongoing process. KP labor-management programs (called "Trusts") fund and support learning activities, training, and higher compensation rates for new roles. Staff personnel receive time off work and tuition reimbursement for eligible courses at partner schools. Department administrators encourage their staff to avail themselves of these resources to get trained and certified on additional skills for upward mobility.

> *"One of my MAs had multiple licenses that made her eligible for the multifunctional role, but her lab draw wasn't sufficient certificate for KP. I told her to find a school, take the education time off, and get the certification. I sent her during the Easter time."*
>
> - Department Administrator, La Habra

5 CONCLUSION

This paper is just the first step toward a more rigorous evaluation to analyze the benefits of these Health Hubs. While quantitative analysis is critical to further confirmation of our observations, we derived important lessons from our field observations and interviews that illuminate one of the premises of the MIT Task Force on the Work of the Future: technology produces better outcomes for organizations and the workforce when integrated with work processes and workforce outcomes.

This case study provides an example of how technology, work systems, and physical space designs can be integrated to serve patients and medical staff. Technologies were designed and modified with input from a wide range of people involved in the visioning, planning, opening, and operation of the new facilities. Well before the new clinics were scheduled to open, work systems were adapted through negotiations with designated labor representatives who were participating in the Jobs of the Future Committee discussions of these issues. Employees—from clinic leaders to physicians, nurses, and service staff—participated in fine-tuning workflows and gaining expertise needed to train their peers in the new work practices. Once the clinics opened, further input into ways to adapt and improve operations is provided by unit-based teams and informal huddles and meetings.

The integrated approach to the use of technology and the early and extensive involvement of the workforce and union representatives observed in this case illustrate the value of working together in a labor-management partnership. However, partnerships like this are the rare exception in U.S. workplaces. There is no union presence in the vast majority of U.S. workplaces, and in workplaces where unions are present, union-management relationships too often tend to be arms-length in nature. Perhaps this case illustrates the potential of and need for moving American labor-management relationships in a more collaborative direction.

While this case study is situated in health care, the processes used to integrate technology, work systems, and physical layout and the extensive opportunities for input may well have implications for other industries. Our hope is that the case provides a basis for discussion and further learning both for the MIT Task Force on Work of the Future and for others engaged in shaping future workplaces.

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