Optimizing Healthcare Through Templating

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What if, every time you had to build a hospital, ambulatory care center or medical office building (MOB), you didn't have to design it from scratch? As health providers look for faster, more cost-effective ways to design, build and operate advanced facilities, many hospitals and health systems worldwide are turning to prototypical, or template, design.

Templating is an iterative design approach to facility development. It is as much a tactical response to the challenges of delivering healthcare today as it is a model of how to design for an industry that is experiencing significant uncertainty and rapid evolution.

Developed and adopted as standard planning guides, templates allow owners to build multiple facilities that are identical in planning concept yet adaptable to different locations, provide a universal standard of care and dramatically reduce the time and costs of design and construction.

Templating allows owners to start at a much higher benchmark. Given the potential for a template to impact many departments or buildings, these owners are investing more time to develop and base their design decisions on best practices. The result: a standardized design that optimizes life-cycle and operating efficiencies of an entire building, responds to the changing needs of patients and developments in medical technology and practice, and ensures consistency in design and construction of new and renovated healthcare facilities.

SmithGroup, the longest continuously practicing architecture/engineering firm in the United States, is ranked by World

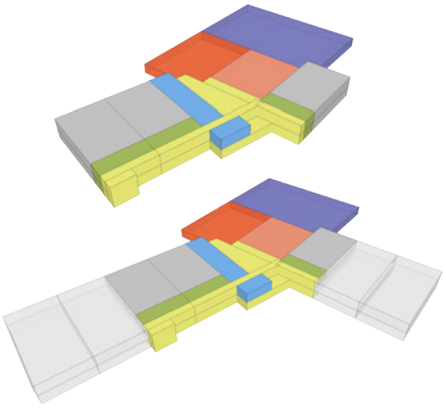
Above:
Kaiser Permanente Antioch Main Entry

Architecture as one of the top 10 healthcare architects internationally. The firm has worked with leading health systems such as the U.S. Department of Veterans Affairs (950 hospitals and clinics), Kaiser Permanente (460 hospitals and clinics) and Banner Health (40 hospitals and clinics) to generate a foundation of standards and best practices that have allowed for this rapid prototyping of a hospital program and design, without sacrificing the quality of the design or patient care.

Faster, Cheaper, Optimized Buildings

Clients turn to template design for a variety of reasons. The major reasons they choose this approach:

Speed to market — An iterative approach to facility development allows owners to adapt a successful design to different sites rather than reinvent the wheel each time. This streamlines the design development process, shortens governmental review time and enables rapid deployment. This is particularly beneficial when building hospitals to meet stringent seismic requirements. Building from a pre-approved template can reduce a lengthy, rigorous regulatory review process.



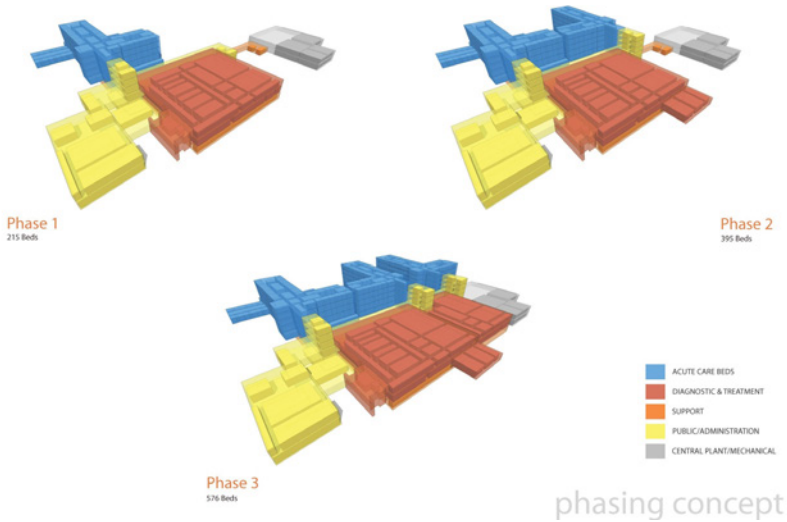
MetroHealth's Outpatient Health Center Template

MetroHealth System, one of the largest healthcare providers in northeastern Ohio in the United States, opted for templating in order to rapidly increase its market share in ambulatory care. Templating allowed MetroHealth to get its outpatient health centers in the ground, up and running in different communities as much as 18 months earlier than its competitors who used a traditional design process.

Kaiser Permanente, America's largest not-for-profit health system with more than 8 million members, chose templating as a way to build 20 new and replacement hospitals over 10 years due to stringent new seismic regulations in California. The SmithGroup project team developed a pioneering design solution that was applicable to a variety of sites and ranged in size from 32,000 sm to 40,000 sm, while still being identical in planning to provide commonality for the delivery

of healthcare to Kaiser Permanente members. The first results of this effort included the simultaneous design and construction of three hospitals totaling more than 112,000 sm and a project delivery system which shortened the overall delivery process by more than one year.

Site selection criteria can be developed as part of a templating project to help speed the site selection process and further reduce delivery time. SmithGroup developed a site selection scorecard for Banner Health, one of the largest nonprofit hospital systems in the United States, to help real estate professionals quickly assess how well a particular site could meet the requirements for Banner's healthcare facilities. Among the considerations: site area, proximity to the population served and existing Banner facilities, accessibility from major thoroughfares, adjacent areas with complementary uses, topography, soil conditions and the degree of natural light and views.



Banner Health Ironwood — Long Term Development Strategy

The first Banner hospital to utilize the new template, Banner Ironwood Hospital in Southern Arizona, was designed and constructed in just 22 months. The facility

Above:
Kaiser Permanente Antioch Dining Patio

Banner Health — Clinic Template

was designed for an initial 86 acuity-adaptable beds, with the ability to support 144 total beds utilizing the same ancillary and diagnostic/treatment chassis. The template allows for continued growth in pre-planned, multiple phases to more than 500 beds, which can be accomplished without interruption.

Reinforce best practices — Templates allow owners to develop operational standards that reinforce evidence-based practices and ensure a consistent level of care throughout a healthcare system.

Banner Health implemented templating primarily to bring consistency to the design and operations of all future Banner Health hospitals and clinics, including additions and renovation projects. This level of consistency allows for more efficient design and construction, more efficient operations, easier cross-training of staff and reinforcement of the Banner Health brand and experience among its diverse consumers.

For Kaiser Permanente's templating program, the design team defined best operational practices and departmental relationships within the provider's existing buildings. The team then used those findings to develop templates outlining common structural and building systems, planning concepts, floorplans, equipment, furnishings and construction techniques. The templates are adaptable to various site conditions and to meet different business needs (e.g., number of beds and service mix) of the system's individual hospitals. Standardizing all of these elements allows Kaiser Permanente to quickly build optimized facilities and provide a consistent level of care across its system.

A design rooted in best practices and applied consistently throughout a care system, whether it includes sustainable materials, ergonomic considerations, or acuity-adaptable patient rooms, has additional benefits. For health systems where doctors and nurses work in more than one facility, consistency in design provides a high level of familiarity with the environment, enhancing staff efficiency, reducing opportunities for clinical error and helping achieve a safer, healthier environment for patients, physicians and staff. Consistency also enables apples-to-apples comparisons when measuring one hospital's operations against another.

Reinforce brand identity — Prototypical design provides a consistent image for owners and a consistent, branded experience for patients.

A main objective for Kaiser Permanente's hospital template project was to create a comfortable, convenient environment for patients and a branded experience that emphasizes wellness. The template standards feature a single point of entry, easily identified by an aesthetically pleasing, circular atrium shared by the hospital and MOB. The interior is organized along a concourse—a multi-level, public circulation spine filled with natural light that connects a variety of clinical spaces and amenities. Regardless of the building's orientation, daylight enters

Opposite:
Banner Health Ironwood Main Entry

through windows, glass-walled walkways and an interior, landscaped courtyard with a healing garden and dining terrace.

The spine provides natural wayfinding through the use of full-height glass to orient visitors to the outside. The cafeteria, centrally located and visible from the entry, is convenient for all members, visitors and staff and reinforces the system's wellness brand message.

MetroHealth looked at the prototyping effort as an opportunity to create an entirely new brand image. Architectural elements on the building exterior replicate the system's logo in a symbolic way. The organization of the clinics and modules provide an accessible consistency for patients. The brand doesn't stop with appearances, but is reinforced through an operational perspective and a friendly, efficient approach to service.

Signature design elements are also incorporated into Banner Health's medical facilities. These include an instantly recognizable logo and lantern feature on the building exterior and the use of masonry pattern and zinc facing on the building's skin.

The building interior is also part of the branded experience. The standardized design is characterized by timeless and classic color palettes created in the client's guiding principles but appropriate to the surrounding region — e.g., desert, mountains, plains or open tundra. Standards also call for the same exterior masonry veneer on interior partitions; warm, wood-tone ceilings; indirect lighting; and open, light-filled spaces with floor-to-ceiling glass to provide expansive views to outdoor, landscaped courtyards.

Above:
Banner Health Ironwood — branded interior experience

Cost savings — Re-using a successful template can achieve significant savings in design and construction costs.

Using the template developed for Kaiser Permanente, SmithGroup was able to immediately and simultaneously design and build three separate facilities. From start to finish, the design fee for the three buildings was significantly reduced than if each hospital and attached MOB had been designed from scratch.

Savings in construction costs can be larger. After constructing one standardized building, the builder will have acquired the knowledge to apply more lean processes on subsequent iterations. This typically results in fewer requests for information from the construction team, fewer change orders, shortened project schedules, fewer construction hours and lower overall costs.

The philosophy behind prototypical design aligns with the philosophy behind pre-fabricated building components. Using pre-fab gaswall units, exam room components and other pre-fab elements can further reduce construction time and costs, enhancing the benefits of prototypical design.

Continuous improvement — Rather than a rigid prescription, a building template should serve as a foundation for continuous improvement and rapid deployment of changes. To this end, it's important to conduct post-occupancy reviews or other follow-up processes to continuously evaluate how well the standardized building is achieving the desired results. Any necessary adjustments and lessons learned should be incorporated back into the template to improve the next implementation of the design.

For example, in the Kaiser Permanente template, most exam rooms are identical in size and configuration. When Kaiser Permanente wants to update equipment, technologies or functional use, the provider is able to test different scenarios on a small scale, including the use of mock-ups, then incorporate the best solutions into their templates for rapid deployment across many facilities.

Standardized, Not Cookie-Cutter

Advanced templating is not a simple, cookie-cutter approach. It necessitates higher-level thinking, deep healthcare expertise and skill. Each client has a unique set of criteria, requiring a unique solution. While an individual client might re-use its template for 10, 100 or 1,000 facilities, that same template will not work as an off-the-shelf solution for other clients. Nor can it be easily modified to meet the needs of a healthcare system other than the one for whom it was designed.

""We do not assume there is only one way to design an excellent hospital, but there are endless ways to design poor hospitals that are not sustainable and are not safe for either patients or staff. The templated hospital is not a static model, but rather one that is continuously being adjusted and improved..."

John P. Kouletsis, AIA, Director, Strategy, Planning, & Design, National Facilities Services

Kaiser Permanente

Optimizing a building design for implementation in multiple locations requires the architect to have a good understanding of the client's goals, strong communication skills, a collaborative mind-set, the ability to dive deeply into operational requirements for every square meter of facility space throughout a healthcare provider's system, knowledge of international standards and benchmarks, and the ability to develop standardized designs to support and achieve client objectives.

What follows is SmithGroup's 7-step process for successful templating.

7 Steps for Successful Templating

1. Visioning — Typically involving a small, core group of senior-level stakeholders from the client organization and senior members of the design team, Visioning is crucial to the project's outcome. This is the step for establishing the client's goals, values, priorities and expectations for the deliverables and for ensuring that the design team is aligned with the client's thought leaders and institutional mission.

2. Develop concept guidelines — The design team uses findings from the visioning process to outline the building program and then translate the client's vision and values into design concepts.

For Banner Health's ambulatory program, which includes facilities in multiple states, this meant developing a family of template options to allow adaptation to differing markets, local cultures and environmental conditions. The templates allow for four health center models—Entry, Neighborhood, Community and Regional—ranging in size from 600 sm to 12,000 sm. Individual building systems or materials vary, but the basic organizational concepts remain the same.

Application of these templates requires three basic decisions to be made at the beginning of each implementation project. Based on the client's service program, what size health center is appropriate initially and ultimately? What type of clinics and ancillary departments will the health center need to accommodate? Where will the proposed health center be located, and which adaptation will be im-plemented?

3. Conduct user group meetings — It's incumbent upon the client to assemble the right stakeholders and ensure their consistent participation throughout the templating process. Ideally, user groups involve several levels of staff representing all of the different departments within the provider's system. User group input is critical to understanding operational needs, identifying commonalities in practice, ratifying best practices, testing different ideas and concepts, and creating system and user ownership of the final design standards.

Not every user group attends every meeting. While developing a radiology suite, for example, a director of radiology and a director of nursing would attend initial meetings to assist with operational scenario planning, provide input around adjacencies and room sizes, and to help in the overall development of a best practices environment for patient care. A couple of technicians and a patient advocate would attend later meetings to provide feedback on the developed ideas and concepts.

The end-user representatives must think globally in terms of what makes sense for the broadest population and the organization. They must be able to envision a future that may be quite different from their exist-

ing facilities. SmithGroup has developed proprietary tools to keep user groups focused on developing optimized solutions. For example, planners use throughput calculators to determine the optimum amount of patients per day per exam room in specific practice areas. Using these tools helps user groups see how a request for more exam rooms in a particular practice area would result in wasted space and that they should stay focused on how to optimize a provider's efficiency in the given environment.

4. Test scalability and flexibility — Templates can be used to design hospitals of any size. The key is to develop a target quantity and then design the building to scale up or down while maintaining an optimized facility. For example, when planning a 200-bed hospital that will ultimately grow to 300 beds or a 500-bed hospital that will grow to 1,000 beds, careful consideration must be given to questions such as:

- How to add bed floors or intensive care units while maintaining an optimized facility?
- At what point will additional shell space be needed to maintain an optimal ratio of operating rooms per bed?
- Will footprints for the future be designed that can be built onto specific components of the hospital?
- How will soft space be built in to accommodate future growth?

Standardized designs that provide flexibility to accommodate the varying needs of specific markets and individual care facilities are typically more successful over the long term. Rather than offering a cookie-cutter solution, an effective design provides a flexible network of parts that can morph and change.

Kaiser Permanente's template consists of a multi-story diagnostic and treatment block organized around a central spine with windows arranged to take advantage of natural light and pockets of soft space to allow for future growth; two triangular nursing towers with two, 24-bed units per floor and decentralized nursing stations; and a separate MOB that is coupled with the hospital and shares a two-story entry rotunda. The template has the built-in flexibility to adapt to differing sites, to meet requirements of local contextual design review committees and to meet growth requirements and changes in service line mix.

Kaiser Permanente's Antioch Hospital was constructed as the baseline, four-story template hospital. It was designed with one-half of a nursing floor as shell space to accommodate future growth of beds. The Kaiser Sand Canyon Hospital has a six-story nursing tower configuration with the upper two and one-half floors developed as shell space for future growth of beds and other functions. The Kaiser Modesto Hospital has a five-story nursing configuration with the upper one and one-half floors left as shell space for future bed growth.

When Banner Health wanted to build a Neighborhood health center on a site that was not wide enough to accommodate the linear footprint for that model, SmithGroup adapted the L-shaped Community model to a linear form that fit the chosen site. This solution allows the health center to grow incrementally, both vertically and horizontally, while maintaining the original model's front door and site circulation.

For a different client, SmithGroup developed a prototype, multi-specialty health center/MOB template which will be used for new healthcare centers, building additions and renovation projects, and has the flex-

ibility to adapt to various sites. The 4,180-sm template building is planned to house 30 physicians, but the model can scale up to 5,600 sm or down to 1,700 sm. The building template accommodates various combinations of primary care, specialty and ancillary care clinics with maximum flexibility for repurposing space as operational needs change. Ancillary support space includes imaging, lab, pharmacy and ambulatory surgery, depending on the service needs of the region served.

5. Publish living documents — Templates are intended to be living documents that are regularly reviewed, commented on and updated to guide a healthcare system through growth and change.

Some health systems publish their standardized floorplans, elevations, three-dimensional BIM models and other documents on internal websites. Department heads and facilities staff refer to these documents when determining how to add new equipment or make other changes.

6. Evaluate results — No healthcare provider wants to build inefficiencies into a facility or repeat mistakes across multiple buildings. Once the first iteration of a template is built, the architect and/or client should conduct a post-occupancy evaluation to determine how well the building supports best practices and meets the client's objectives. Any necessary adjustments should then be made to the templates in order to build it better the next time.

When Kaiser Permanente built the first iterations of its hospital template, the projects were phased so that as soon as one hospital was built, the project team could learn from that, make adjustments and then execute the next hospital faster and at higher quality.

No matter how much flexibility is built into a design, every template has a shelf life. Different components evolve at different paces. Templates need to be updated at regular intervals to keep pace with change and for continuous improvement. For example, a smaller component such as a charting station or modular nurse work area that typically undergoes more rapid change due to evolutions in technology, furniture and work practices should be revisited at least once every 18 months. An entire nursing floor or other major component that would entail significant redesign should be re-evaluated at least every five years.

7. Repeat — Re-use your successful template to replicate optimized buildings.

Ideal for Fast-growing Markets

Whether you're planning to build 10, 100, or 1,000 hospitals over the next five to 10 years, templating will allow you to build them faster and more cost-effectively than designing each hospital from scratch. Quickly being adopted by healthcare providers worldwide, templating is a particularly smart approach for providers in fast-growing markets serving a mass population.

When you're templating a building, you're templating the operations inside that building and planning for future flexibility to get the most out of a single design rollout. Before embarking on a templating project, you'll want to make sure you have people with the knowledge, expertise and experience on your team to help you come up with the right information and the right solutions to repeat proven design concepts on all future projects.

Are You Ready?

Templating provides an opportunity to leverage the collective knowledge and expertise of professionals inside and outside a client's organization. It is not a process to be undertaken lightly. Before signing on, consider the following four questions:

1. Do you have the time and resources to go through all of the steps that are necessary to create an effective template program?
2. Is your organization aligned with creating multiple buildings of the same design?
3. Does your design team have the sophistication and experience to guide you through the lengthy pre-planning process?
4. Do you have the staff and resources to maintain and continuously update your templates?

Matthew Richter

Matt Richter has provided planning and design services for more than 50 million square feet of healthcare construction . He has been extensively involved with the creation of hospital and ambulatory healthcare templates and prototypes for such clients as Kaiser Permanente, MetroHealth, and Banner Health.

Heather Chung

Heather Chung possesses a distinct combination of architectural design experience, coupled with a background in facilities strategy, systems analysis, and research and analytic modeling. As Director of SmithGroupJJR's Strategic Planning Studio, she directs the planning and programming activities for a range of healthcare projects spanning community hospitals to major academic medical centers.

Chee Keong Lin

Chee Keong Lin has over 20 years of experience, and has been involved in all phases of the profession, including programming, planning, design, documentation and administration for advanced technology, healthcare and institutional projects. His experience includes the master planning effort for the VA Palo Alto Medical Center, for which he is currently the team's Lead Planner.