

CPOE - Big Bang vs. Phased-In Rollout - Hallmark Health Did Both

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The Pros and Cons for Success

Founded in 1997, Hallmark Health is a leading community-based, nonprofit healthcare system serving Boston's northern suburbs. The cornerstones of the Hallmark Health system are its two community hospitals, [Lawrence Memorial Hospital](#) of Medford and [Melrose-Wakefield Hospital](#). The system also includes the [Hallmark Health Medical Center](#) in Reading, [The Malden Family Health Center](#), [Hallmark Health Cancer Center](#) in Stoneham, [Hallmark Health Home Care](#) in Malden, [Eli Pond Physicians](#), long-term health care facilities, diagnostic facilities and community health programs.

With more than 400 physicians, Hallmark Health provides high quality healthcare by offering the latest technologies and treatments. They also meet the changing health needs of more than 500,000 residents in the communities it serves.

[Lawrence Memorial Hospital](#) is a 134-bed acute care hospital offering a range of medical services, including general surgery and medicine, oncology, geriatrics, medical-psychiatry, cardiac care, emergency care, day surgery and outpatient care. A Big Bang was the implementation approach for CPOE.

[Melrose-Wakefield Hospital](#) is a 234-bed community hospital offering a range of inpatient and outpatient services, including acute medical care and surgical care, oncology, cardiac care and catheterization lab, emergency care, a maternity service and a special care nursery. A Phased-In rollout was used for this hospital.

Hospital Honor Roll for Quality Patient Care

Lawrence Memorial Hospital of Medford and Melrose-Wakefield Hospital have been named to Harvard Pilgrim Health Care's Hospital Honor Roll. No other hospital in the region received this distinction, which recognizes hospitals for high quality patient care. This honor ranks these Hallmark Health System hospitals among the top hospitals in New England.

Big Bang versus Phased Rollouts - what is the best approach to implementing complicated clinical applications such as Computerized Physician Order Entry?

For Hallmark Health, Big Bang at their Lawrence campus was defined as a goal of 75% of all physicians (excluding ED, which was slated to go Live with the Melrose campus) entering orders within 3 weeks of launch.

A Phased Rollout at their Melrose-Wakefield campus was defined as three distinct launches – Med ICU and associated Telemetry unit in Phase 1; remaining Med/Surg units in Phase 2; Psych in Phase 3, with 75% of all Physicians in compliance with CPOE usage. Both EDs are scheduled to launch after the inpatient rollouts at both facilities are complete.

As with most implementations, there is no single 'right way' to roll these projects live. There are pros and cons to each approach, and some lessons learned from both.

One concept that is first and foremost is that CPOE is a Clinical project, not an Information Technology project. The Business Owner is typically a hospital's Chief Medical Officer, and/or Chief Medical Information Officer. It is he or she who will be the decision maker for approach and conflict resolution.

A major planning requirement for the rollout approach is to determine which model is applicable for the particular facility. Business Owners need to understand that making a change to a factor of the Triple Constraint - scope, time and resource - requires a change to at least one of the other two. So, increasing the rollout scope from Phased to Big Bang would require an increase in resources and a change in the schedule.

A Big Bang is exactly what the description implies - a one-time, massive, all inclusive approach, where the application is implemented live across the entire facility at the same time.

Many would consider the Big Bang a bold approach, and that in itself could be considered a positive factor, meant to instill confidence in the team and application build, thus reducing anxiety. The transition time for the facility could be significantly reduced, potentially reducing the extended support required for any such implementation, and conversely reducing the budget.

Phased approaches take more conservative routes to implementation. Going live occurs either a unit at a time or several units at once, depending on factors such as physical location, specialty, or shared staff.

Phasing units live, while extending the time frame for house-wide implementation, reduces the scope of training within limited time frames, allows more flexibility for the staff, better support focus during the immediate days post-live, and less impact to the house if there are schedule changes.

These are several aspects to consider when contemplating the best approach for launching advanced clinical applications. To make a more informed choice on the approach, the project team and business owners should consider some additional details of the project.

Application Build

One of the main areas of the CPOE application build-out is the evaluation and modification of application dictionaries used directly in the ordering process.

Specifically these include the procedures dictionary, the pharmacy formulary, and the creation of order sets. Each unit must be reviewed for process workflows, the flow of data within and between applications, as well as the data that will be retained on paper for incorporation into the application.

This will define the procedures, medication SIG ordering 'strings', and Order Sets needed to launch CPOE. At its most basic, the application must be built out to accommodate any medication or procedure ordered on the floors, and to convert the paper-based Physician Order Sets into groupings that are easily selected.

The size of the facility, and the more specialized services provided, directly translates into more complex builds.

It is this volume of Order Sets, with the associated procedures and medications that add time and complexity to the build. While these will need to be built at some point in the project, a Big Bang requires that all hospital defined Order Sets are finalized before the rollout begins.

Testing and QA

Hand in hand with the complexity of the build is the time needed to adequately test the build and get sign-off on the quality of the application components from the various end-users. The application must fulfill the workflows and satisfy the physicians, nurses, and clinical ancillary staff who will be reliant on the system.

The volume of scenarios will not change - the project team will need to build out every procedure, med string, and order set defined at some point in the rollout - but the build prior to launch must be in a more advanced state of completion for a Big Bang than for a Phased implementation.

Conversely, along with the state of the build, the amount of testing, QA and signoff must also be at the same proportional state of acceptance. Testing and QA are not done just once, but many times, both prior to any implementation – including the pilot – and subsequently, after the initial Go Live is complete and adjustments are being made. Testing and QA will involve end users from as many disciplines as possible.

Training

Three of the base components of training are the creation of training materials and curriculums, End User and Trainer resources and availability, and the

timeliness of the training.

As with the Big Bang application build out, the size of the simultaneous rollout dictates that more customized materials need to be created in advance of the implementation. A Phased approach allows the development of the materials as the rollout progresses.

Big Bang necessitates that more staff - physicians, nurses and floor staff, and clinical ancillaries - need to be trained within the same time period, not only on the generalities of the system, but also on the specific scenarios that may be found only on certain units.

The training aspect is further complicated by the fact that training must occur within a certain time frame - typically about 30 days prior to go live - for the users to retain what they were taught.

Regardless of the approach, all of the above can only be accomplished with adequate documentation and training resources. A Big Bang will complicate the training plan, as preparing the classes and training more students within a fixed time requires larger and more frequent classes. More trainers will be needed to assist with questions, individual training, and follow-up refresher sessions.

Larger classes also potentially take more nurses off the floor, which leads to more simultaneous floor staff back-filling. Unless a significant percentage of training can be accommodated during off-shifts, nurses will need to attend training classes during their scheduled working hours - which requires back fill on the floor to ensure adequate levels for quality patient care.

Physicians, commonly trained in small groups or one-on-one sessions, pose a different challenge than the nursing staff in terms of availability for training. In a Big Bang scenario, this may necessitate that physician trainers will need to extend the typical flexibility required - training in the early morning immediately after rounding, training in the evenings, and training at any location that is convenient to the physician - to a larger scope to accommodate the larger volume of physicians requiring training within an appropriate time frame. It also leads to an extended body of knowledge needed to address training to any specializations.

Training resources, like Support, can come in part from willing and able Nurse Superusers. These invaluable staff could also be Subject Matter Experts who assisted in workflow analysis, testing scenario development, and assisted in tactical decision making.

Project and Staff Resources - Availability and Budget

Regardless of the approach - Big Bang or Phased - the application build, user

training and support, and staff availability all require resource allocation.

For the discovery and build phases, the project team must be given adequate time to effectively discover, design, develop and test the software. This is also required regardless of approach.

At the same time, staff resources must be made available to teach the project team how their work is currently performed - current workflow process - and how some of those processes would change with the introduction of the new systems.

Depending on the complexity of the workflows, this discovery period could extend as synergies and similarities are documented and comprehended by the teams, and translated into the application. Specializations must also be discovered and built out.

In either Big Bang or Phased approaches, these tasks are performed in sequence - discovery and understanding take place, followed by system design, development and vetting by the end user. Final unit, integrated and parallel testing close out the bulk of the development phase, concluded with the pilot launch prior to full rollout.

In the Phased model, these tasks are spaced out over the unit rollout sequence, spreading out the pressure of understanding and increasing the potential of more fully comprehending all the nuances of a hospital operation as the project continues.

The pilot, which will expose some processes and application design fine-tuning, is geared for a general Go/No Go, and is rarely geared towards testing every element of a hospital's entire suite of processes.

In a Big Bang, all the definition, comprehension and development must be complete house-wide before the live date. This could pose a challenge to the project team in terms of absorption and system development, and of the pilot to expose any critical-to-Go Live issues.

For example, the process of discovery through development on a non-telemetry floor, and the synergies shared between that and other Med/Surg units, is different than for the ICU. In a Phased model, Med/Surg could be transitioned Live while the ICU phase, starting with discovery, is underway. In a Big Bang, all must be finalized before any post-pilot unit goes live.

Note that the budget may be affected if the volume of required application build, training and support staff needs to be accommodated by more expensive resources if enough less-costly resources are not available. From a budget perspective, this may be a wash - more resources for a shorter period of time, compared to fewer resources kept on staff longer.

From a skilled support perspective, it may be a challenge to acquire sufficient skilled resources to facilitate a Big Bang, although nursing Superusers may be an option.

Patient Transfers and Staff 'Floating'

When planning a Phased approach, the float patterns of staff may help to decide the sequence of rollout, which affects the training plan. Same with patient transfer patterns between levels of care. There will be a need to create hybrid processes such as transfer between a CPOE-live unit and a non-CPOE unit, and vice versa.

In a Big Bang, these factors are not as significant, as all units would be using the application, so hybrid transition processes are not needed.

Float staff training can be a challenge in a Phased model, especially if the float patterns between CPOE and non-CPOE units are not predictable or consistent.

Hospital Culture and Makeup

How much transition can a hospital accept? Is the facility a teaching hospital, with residents that are becoming more and more exposed to automated systems as they come into their residencies, and may potentially enter orders for physicians? Is there a hospitalist service that will become very facile in the system because of the repetitions they receive? What are the opinions of senior leadership? And will they give the visible support that any project as complex as CPOE requires to be successful?

An aspect of a hospital's culture should also look at practices that have evolved over time. While there are many commonalities surrounding quality of patient care, every hospital develops its own unique personality and workflow patterns to treat patients and address practice issues as they impact patient safety.

For instance, Order Entry itself - who places orders, based on what type of communication (paper vs. verbal vs. telephone) will significantly change. Is the hospital leadership prepared to support the nursing staff when they insist a physician place their own orders when they are on the unit? Will nurses embrace that ability? Will physicians be mandated to use the system? Do unit secretaries place orders? Will that change?

All these are cultural aspects, not only of an individual hospital, but of the hospital healthcare industry itself. The evolution of the hospital relationship hierarchy has taken place over centuries, based largely on the education and prominence of healthcare professional roles. With the advent of more complicated systems, the relationships are shifting somewhat. These shifts will also need to be considered.

Support

Success is largely measured by user acceptance, and user acceptance is shaped by the amount of available support. Support is resource based. The more users going live, the more concurrent support needed.

One emerging concept is to move the nursing staff live in advance of the physician staff, creating a home-grown support staff that will be in place for the long term. This does not eliminate the need to ramp up support for the first 3 weeks or so of 24/7 Go Live support, as the same nursing staff resources will be unable to both support the launch and provide patient care simultaneously.

Nursing Superusers have been touted as a panacea in the past, and this concept should be looked at realistically as being potentially part of the solution, but not the entire cure.

One assumption of physician training is that it is more of an exposure to the system, rather than an in-depth session that results in comfort level with the application. Another assumption is that 75% of the physicians will need individual support for the first 10 order entry sessions until they gain enough repetitions to be adequately comfortable.

In a Big Bang, this will increase the number of concurrent support resources needed, as the number of units to be supported simultaneously is greater than a Phased approach. The support period will be shorter, as opposed to a Phased approach where the number of concurrent support staff will be lower, but will need to be retained longer.

Regardless of the approach, the role of the Physician Champion cannot be understated. He or she will be the backup, the safety net behind the Support staff as they assist and encourage physicians to use the system, and to answer any clinically-related questions or comments.

A concept to keep in mind is that CPOE is a clinically-driven project, not an Information Technology endeavor, even though there is a large IT component.

Flexibility of Timeline

A Phased model allows the timeline to be somewhat variable, and a change in the go live date will only affect those units scheduled for that phase. In a Big Bang, delaying the launch impacts the whole house.

One aspect of any project is that there will be change, and date changes are very common. A Phased rollout allows for date changes in different phases without resonating impact throughout the campus.

Time of Transition

A Big Bang by definition is the shortest route to a fully implemented system, compared to a Phased rollout which could - and has been known to - take up to a month between units. A hospital with the following configuration - 4 Med/Surg units, ICU, Labor & Delivery, PACU, Psych and Pedi - could take between 6 months to a year to complete the full implementation.

Hybrid Processes

As a hospital transitions from a paper environment to a more-computerized facility, some processes such as patient transfers require an intermediate hybrid workflow to be created until the entire campus is on the new system. This is less of an issue with a Big Bang than a Phased implementation.

Summary, Outcomes and Recommendations

Either approach can be successful. The most mitigating factor under the hospital's direct control is the resource allocation. The greater the scale of implementation, and the shorter the schedule, the more resources needed to accomplish the implementation as desired.

As Lawrence Memorial demonstrated, a Big Bang is feasible and is preferable in terms of shortening the transition period to a computerized system and diminishing the need for hybrid processes.

However, direct experience in three CPOE implementations, plus the lessons learned from peers in the industry seem to support the Phased approach as being more viable and sustainable and with lesser impacts should adjustments need to be made.

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Publication Date: 12-JUL-04