Today, information technology (IT) is vital to most any organization. Regardless of the nature of business, we have become reliant upon computing technologies to support how we deliver our missions. The processes that deliver financial, workforce management, supply management marketing and sales, customer relationship management, Web exchanges and messaging capabilities are defined by available and deployed technology enablement. Further, for care delivery organizations (CDOs), the classes of IT systems are continually expanding to further support:

- Patient access
- Clinical care processes
- Clinical resource utilization
- Diagnosis and treatment
- Biomedical monitoring
- Emergency response management
- Quality and care management
- Evidence-based medicine content support
- Clinical decision making and point-of-care support
- Health information management
- Revenue cycle and payer support

To ensure any organization has well-positioned its IT-supporting capabilities, the IT life cycle must be a relevant and practiced management competency so that it is understood and acted upon with discipline. Such a life cycle includes the elements of:

- Planning
- Selection and acquisition
- Design
- Development or building
- Implementation
- Ongoing redesign and support
- Eventual sunset
Upon a sunset decision, the life cycle approach to management expects that planning is again underway unless some newly developed means to deliver the capability has been developed or the capabilities of support in the then-current state have become obsolete. An example of a structured life cycle approach for IT management is illustrated in Table 1-1.

**Table 1-1: Structured IT Life Cycle Example**

<table>
<thead>
<tr>
<th>Phase 0 - Planning</th>
<th>Phase 1 – Selection and Acquisition</th>
<th>Phase 2 – Implementation</th>
<th>Phase 3 – Support</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Concept description</td>
<td>• Requirements definition</td>
<td>• Project chartering, scope assurance, work planning and resourcing</td>
<td>• Ongoing support</td>
</tr>
<tr>
<td>• Business case development</td>
<td>• Build vs. buy decisions</td>
<td>• Design – technical, data, functional, workflow, workplace, rules, content</td>
<td>• Technology upkeep</td>
</tr>
<tr>
<td>• Authorizations to proceed</td>
<td>• Vendor package fit to requirements</td>
<td>• Build</td>
<td>• Application upgrades and enhancements</td>
</tr>
<tr>
<td>• Budget support</td>
<td>• Solution agreement</td>
<td>• Test – unit, volume, integration</td>
<td>• Integration support</td>
</tr>
<tr>
<td></td>
<td>• Contracting</td>
<td>• Education</td>
<td>• Content support</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Go-live</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Post-implementation turnover management</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Post-implementation lessons learned</td>
<td></td>
</tr>
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<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

**THE IT PLANNING LIFE CYCLE**

Planning is a key element of the IT life cycle. The practiced IT savvy professional—whether the chief information officer (CIO), IT planner or a line-IT manager—recognizes that the life cycle elements are inter-related with good planning as its foundation.

Planning as a key life cycle element has its own set activities. Therefore, it can be delivered to an organization as a defined, predictable process for the adoption and practice of management. As IT planning evolves in a sophisticated CDO, it will most typically include:

- Review of organizational strategy for assurance and understanding;
- A forum to generate ideas that merit examination as candidate IT initiatives—both strategic and tactical—that enable mission;
- Methods to assure that initiatives demonstrate mission alignment and “fit” the organization’s IT identity;
- The means to describe the ideas, measure their value and compare them for prioritization;
- Efforts to assure the necessary infrastructure, data management and technology-supporting needs for new and existing applications; and
- Defined decision makers, sponsors and facilitators.

Figure 1-1 provides an illustration for such an IT planning process. Each of these activities will be described in the chapters that follow.
Figure 1-1: The IT Planning Process

PLANNING TIME HORIZONS AND ORGANIZATIONAL BUDGETING

The planning life cycle goes beyond the IT needs for any CDO. Examples of outputs from various CDO planning processes include:

- The five-year strategic plan
- A three-year capital and financial plan
- A long-range facilities master plan
- The annual budget
- The strategic research plan
- A business unit’s tactical or strategic plan
- A physician or market strategy (typically elements of the strategic plan)
- The IT plan

Planning time horizons vary to support the needs of a particular CDO. This is due both to the CDO’s perception of the strategic need for longer-range definition and to the practicalities involved with making such futuristic predictions. Organizations often choose three-or five-years as the strategic planning horizon.

Further, CDOs that are competent at planning will generally revisit its plan efforts annually to “refresh” the plan. Such an annual process allows the CDO to:

- Update the plan for just-completed accomplishments;
- Replan where things may have turned out to be different than original expectations;
- Reset priorities as new ideas have emerged;
- Refresh budgets, work products and deliverables; and
- Add a new “out-year” to the plan effort.

The concept of refreshing a three-year IT plan is demonstrated in the example provided in Figure 1-2.

A multi-year IT plan ensures that related initiatives can be practically associated and so contracted. For instance, where a CDO is positioning to deploy an electronic health record (EHR), it must understand that the component elements follow a likely progression in building block style. One representation of how component elements
evolve for greater collective functionality is that of HIMSS Analytics’ Electronic Medical Record Adoption Model or EMRAM. This model has been developed by HIMSS Analytics to assess the status of clinical system/electronic medical record (EMR) implementations in CDOs, specifically hospitals. This model demonstrates that U.S. hospitals yet have a long journey ahead of them to reach full capability.

It is important to understand that although there are definitional differences between an EHR or EMR, they are both evolving systems comprised of many elements. Clinical capability is materially enhanced as elements are added. Thus, as stages of deployment are evolved, so evolves the care delivery process. Planning for an EHR requires an understanding of its collective elements, how those elements interrelate, any necessary predecessor relationships and the organization’s priorities for implementing those elements on the basis of value. Without a framework that assures that understanding, it is difficult to position all of the component parts over a multi-year time horizon and gain necessary organizational support. That said, the EMRAM provides a keen example from which one can draw these interdependencies and also provide an industry benchmark comparison.

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Note: The terms EHR and EMR are used in this publication to describe a fully functional clinical suite of products that are integrated in a manner to provide a patient-centric view of care across a continuum across care settings or uniquely in one setting as a hospital or physician practice, respectively. Various uses of these terms exist across our industry, thus most CDOs converge to a working definition for its purpose. The *HIMSS Dictionary of Healthcare Information Technology Terms, Acronyms and Organizations* is a useful source to craft such a definition for your CDO.

Also with regards to the EHR, selection of some components may permit choices that can be made apart from others. Some components, however, require a level of integration with other elements that may compel the CDO to acquire them from a single technology vendor (if not performing in-house development). Hence, a vendor direction regarding such choices may be a key element to an IT plan and may cause a critical need to contract for a succession of EHR components over a period of time. Hence, the need for multi-year IT planning for such an initiative is necessary.

Figure 1-3 provides a representation of this model. As individual components are layered and shared by and between other elements, overall clinical transformation is enabled. Understanding how the elements associate to one another is necessary if a CDO expects to use an EHR to change how it provides care delivery.

![Figure 1-3: Electronic Health Record Adoption Index](image)

<table>
<thead>
<tr>
<th>Stage</th>
<th>2006 Median Score</th>
<th>2007 Median Score</th>
<th>Range</th>
</tr>
</thead>
<tbody>
<tr>
<td>CDO</td>
<td>2.3</td>
<td>3.3</td>
<td>-</td>
</tr>
<tr>
<td>State</td>
<td>1.8</td>
<td>2.1</td>
<td>0–5.2</td>
</tr>
<tr>
<td>U.S.</td>
<td>1.7</td>
<td>1.9</td>
<td>0–6.2</td>
</tr>
</tbody>
</table>

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There are eight stages of the HIMSS Analytics Electronic Medical Record Adoption Model (EMRAM) with each stage representing advancing EMR capabilities:

- **Stage 0**: The hospital has not implemented key, basic clinical department IT applications such as laboratory, radiology and pharmacy.

- **Stage 1**: The key clinical department systems identified in Stage 0 have been implemented to support improved data management for diagnostic procedures.

- **Stage 2**: A repository of clinical data collected from Stage 1 applications is available for access by clinicians anywhere in the healthcare organization, eliminating the need to have access to paper charts for diagnostic data, thereby improving care delivery.

- **Stage 3**: Nursing applications are implemented to provide standardized documentation of vital signs, flow sheets and electronic medication administration records. In many cases, reduction of nursing overtime for charting or use of agency nurses is significantly reduced or eliminated. Job satisfaction for nurses is also enhanced with the accomplishment of this stage.

- **Stage 4**: Physicians begin using computerized practitioner order entry (CPOE) to generate medication, diagnostic and therapeutic orders. A level of clinical decision support is embedded in CPOE to check for many types of order conflicts such as drug/drug or drug/food interactions, providing increased patient safety and reducing/eliminating unnecessary orders. This action drives down costs.

- **Stage 5**: Closed loop medication processes that ensure that the right patients are administered the right drug at the right time by the right route (e.g., mouth, injectable, intravenous) and for the right dose (i.e., the “five rights of medication administration”). This stage requires the integration of bar coding technology with clinical applications so the nurse, patient and drugs are all bar coded. This is the most complex and costly stage due to the application integration and workflow reengineering that must be implemented. This stage will ensure the highest level of patient safety for medication processes.

- **Stage 6**: Physician documentation and all radiology picture archive and communication system (PACS) modalities are implemented, providing digital images that can be easily distributed to all clinicians involved in a patient’s case. This EMR capability provides another level of operational efficiency, quality improvement, cost reduction as well as higher clinical outcomes and patient satisfaction.

- **Stage 7**: The healthcare organization is paperless. The EMR is comprised of discreet data, document images and digital medical images. The patient’s medical data can now be more easily shared with other healthcare organizations.

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Infrastructure is the foundation upon which IT application capabilities are built. Similarly, for the component elements to “fit” together over a period of time, a technology direction must be architected and re-architected to support predicted and evolving organizational application needs. This provides yet another basis for a multi-year IT plan.

Many CDOs expect that IT planning efforts span a multi-year time horizon. This idea may be unnatural for those CDOs that do not have planning processes in place for other like concerns such as facilities planning and financial planning. In fact, a multi-year IT plan may be viewed as an opportunity for IT needs to “go to the front of the line,” getting in front of other capital priorities as such items may not be developed in a like process. This is one cultural affect that should be considered in developing an IT plan. Several others will be discussed in the chapter entitled “Culture and Strategy.”

**END IN MIND**

A best practice planning approach is that of beginning with the end in mind. Discuss the planning horizon alternative with executive management at the onset of IT planning activities and agree to a specific time horizon.

One should recognize that creation of an annual IT plan is a base necessity if nothing but to support the CDO budget cycle. Where possible, the IT planning work products and deliverables should be scheduled to coincide with development of like-elements of the capital and operation budget process. By associating IT planning to the budget cycle, it will be in step with an already familiar process even though its content is different. Similarly, utilizing existing decision-making bodies is an important consideration. After all, IT is only one of several priorities that must be examined in aggregate.

**ROLES OF IT GOVERNANCE AND THE PLANNING TEAM**

IT governance supports key decisions along the IT life cycle. Thus, IT governance supports key elements of IT planning. Effective governance will provide critical steerage to the both the planning process and its deliverables. Governance may author strategic ideas for consideration as candidate initiatives and provide requisite input regarding strategy alignment, application portfolio “fit” and inter-business unit priorities. Further, governance provides the litmus test for cultural implications on IT plan decisions.

The governance committee or group may be responsible for final decision making regarding the IT plan. However, it is likely that IT planning and CDO budgeting decisions must occur through one body to deliver both related outcomes. For this reason, this group is likely comprised of the key executives for the CDO. It may or may not include CDO board representation, though will most certainly present its deliverables to the board for approval and assurance.

IT planning will require a team effort that may come from one or more facilitative groups. Depending on CDO size and complexity, one such group may be that of an IT planning team of business unit liaisons. The primary charge of this team is that of assuring that the planning process is followed and supported. Liaisons will work with business units to gather the compendium of strategic and tactical candidate ideas.

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7  Covey S. *The Seven Habits of Highly Effective People.* New York: Simon & Schuster; 1989; pp 95-144.
culling that list to a reasonable number for business case development. This team will also work with information systems knowledgeable staff to mature the candidate initiatives and build out the associated business cases. In short, this team works in support of governance and is also critical to ensure plan development.

Other teams that may play a role in IT plan development include a CIO council and an IT infrastructure team. The CIO may have a council that is comprised mostly of the IT leadership team and may also have the routine involvement of select key non-IT leaders who have a significant stake in technology outcomes. In addition to its other routine management functions, the CIO council can be the primary IT resource to support IT plan development. This council may also troubleshoot, provide advice and subject matter expertise and serve as principal developers of the technology elements of candidate business plan content.

An IT infrastructure team can augment the CIO council efforts and may be particularly effective where the CDO does not have a formal or de facto chief technology architect or officer. This team is populated with the key technology-knowledgeable individuals in the organization. The infrastructure team’s charge is to care for the infrastructure direction and needs of the organization. This charge requires that the infrastructure team review and understand the technology implications of currently planned activities and candidate initiatives. Tactically, this team will develop and continually refine infrastructure roadmaps that provide an understanding of the direction and strategies necessary to deliver the CDO’s desired IT application portfolio.

Figure 1-4 provides an example organizational structure for a CDO planning effort with key constituents and approving bodies necessary to support IT planning.

![Figure 1-4: Example CDO Planning Constituents and Structure](image-url)
Notably, there are numerous governance models for the management of tactical initiatives that occur in support of the IT plan, including project working and oversight teams, ad hoc sub-teams, program management functions and the like. These teams and committees should be understood and coordinated with the planning efforts; specifically for multi-year initiatives as they will require annual re-plan activities to true-up the plan with actual occurrences.

The IT Governance Institute (ITGI) suggests that effective IT governance is predicated upon the presence of effective organizational processes in five domains: value delivery, strategic alignment, risk management, resource management and performance measurement. Table 1-2 provides the definitions for these IT governance domains.

There are specific “gates” through which an IT candidate project passes on its journey from inception to approval. In mature CDOs, those candidate projects require business case support and may follow timing that is either consistent with the budget cycle or may be subject to ad hoc review if the business need is compelling. In addition, a functional IT governance structure would be well-positioned to routinely convene for review and approval/denial/deferral and support at specific junctures along the business case continuum. Such a process is much like that of a business sales “funnel” illustrated in Figure 1-5.

Table 1-2: Definitions of IT Governance Domains

<table>
<thead>
<tr>
<th>IT Governance Domain</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Value Delivery</td>
<td>The extent that investments in IT deliver expected benefits</td>
</tr>
<tr>
<td>Strategic Alignment</td>
<td>The extent that investments in IT are aligned with business goals and objectives</td>
</tr>
<tr>
<td>Risk Management</td>
<td>The extent that investments in IT reduce risk to the organization</td>
</tr>
<tr>
<td>Resource Management</td>
<td>The extent that investments in IT optimize use of resources</td>
</tr>
<tr>
<td>Performance Measurement</td>
<td>The extent that the effects of investments in IT can be transparently and accurately assessed</td>
</tr>
</tbody>
</table>

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9 Carpenter R. IT Governance. Guest Lecture at University of Alabama-Birmingham; January 8, 2005; Birmingham, AL.
Figure 1-5: IT Candidate Business Plan Approval “Gates”*

* Adapted from Carpenter R. IT Governance. Guest Lecture at University of Alabama-Birmingham; January 8, 2005; Birmingham, AL.