

Automation Master Planning

“Automation is crucial for future competitiveness in the electric utility industry.” This statement has become widely accepted even though, in many cases, past expenditures for automation have not resulted in the anticipated level of benefits. Many utilities are actively purchasing and installing expensive automation systems but at the same time there is often no logical, long-term approach taken as to how automation should be employed.

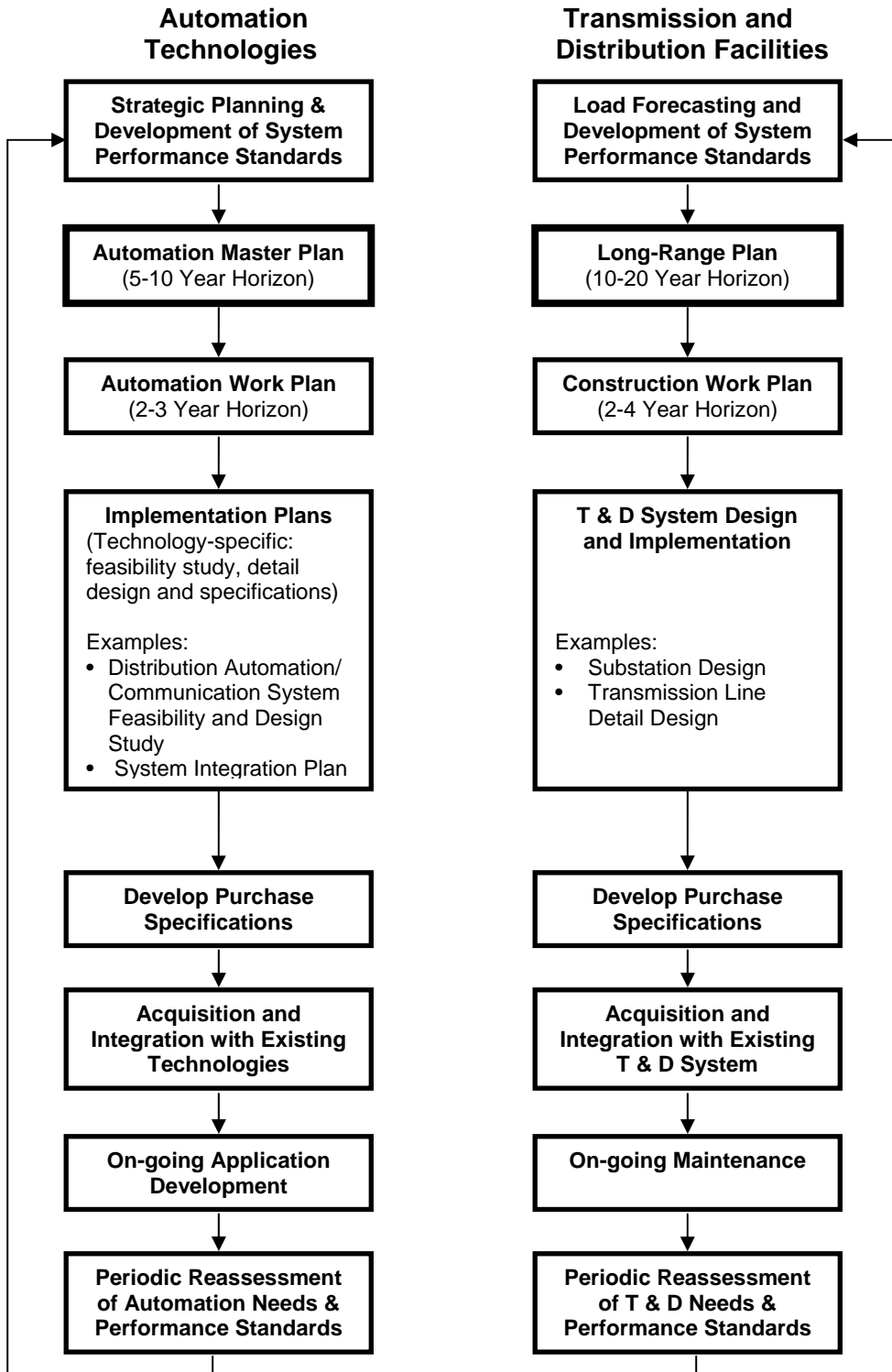
It is interesting that utilities spend considerable time and resources planning for T&D facilities; that part of the utility’s business with which they are most familiar, and yet they perform little or no strategic planning for the implementation of costly automation technologies. This is doubly surprising given the characteristics of the automation technologies:

1. There is a wide range of options.
2. The technologies are less well understood than is T&D hardware.
3. Many utilities, particularly those with smaller staffs, may lack the expertise to implement automation technologies and therefore must depend on suppliers for guidance.
4. There is less standardization of products than with T&D hardware making specification, purchase, and implementation much more involved.
5. The technologies are expensive to purchase.
6. The technologies may require specialized expertise to maintain.
7. Although the advent of integration tools has somewhat eased the problem, if care is not taken, the installation of a technology creates an “island of automation” which isolates the new application from the day-to-day operations in the rest of the utility and increases the effort required to keep critical data up-to-date.
8. If the technology purchase is not accompanied by optimization of business practices, it can result in merely the automation of inefficient or outdated manual practices.
9. The cost of choosing improperly is high including the potential for rapid obsolescence.
10. A “shotgun” approach to the application of automation systems generally results in higher total costs than does an integrated approach.
11. Effective use of the technologies often requires the collection and maintenance of specialized data that are not currently available. This hidden cost is often overlooked in the decision to deploy new technologies.

All of these reasons tend to increase the need for careful evaluation of how automation technologies should be chosen and deployed.

We have termed the process by which automation technologies are evaluated for relevance to the utility, planned for, implemented, purchased and integrated into the utility as Automation Master Planning. Figure 1 shows that this process, although new when applied to automation technologies, is one which is very familiar to utilities; the steps parallel those used in T&D facilities planning, analysis, and implementation. Two particular pieces that are seldom practiced today, but seem to offer considerable benefit, are the Automation Master Plan and the Automation Work Plan. They are the counterparts to the Long-Range System Planning Study and Construction Work Plan, respectively.

Figure 1
Incorporating Automation Technologies into Utilities -
Parallels to Planning, Design and Acquisition of T & D Facilities



The **Automation Master Plan** is a high-level planning study with a five to ten year planning horizon. The Automation Master Plan would be developed from an analysis of such factors as:

1. Current status of system automation.
2. An assessment of in-house resources (existing automation systems, communications infrastructure and personnel).
3. An evaluation of potential modifications to existing automation and information systems that would facilitate more effective interoperability among systems.
4. Specific current utility challenges.
5. System strategic and long-term goals.
6. Expected budgetary constraints.

Typical contents of such a plan would include:

1. Optional near-, intermediate-, and long-term scenarios to meet the corporate objectives at various levels of investment.
2. Recommendations for choices among the optional scenarios that would result in optimal cost-effectiveness and performance.
3. A phased conceptual plan for rollout of the recommended automation systems to meet the objectives of the utility including budget and manpower resource estimates.
4. An evaluation of the communications infrastructure to cost-effectively support the entire range of planned technologies, rather than choosing communications on a system-by-system basis.
5. Worksheets to enable the utility to revise the plan in view of future technology developments and changing costs.
6. An outline of potential pitfalls to avoid in automation implementation and critical factors that would foster success during the implementation phase.
7. An outline of emerging trends that the utility should monitor in the specific technology areas of interest.

The **Automation Work Plan** is a more detailed study of specific actions to be taken in the short-term in order to effectively deploy a set of related technologies. As such, it corresponds to the Construction Work Plan. The automation work plan deals with issues such as:

1. Definition of desired characteristics of the proposed automation technology.
2. Review of current business processes to determine the need for reengineering in anticipation of deployment of the proposed system.
3. Phased implementation planning.
4. Short-term budgeting and cash flow planning.
5. Short-term manpower planning.
6. Planning for integration with existing infrastructure, (information systems, other automation systems, communications facilities and T & D facilities).
7. Assessment of data needs for the proposed technology and plan for collection of the required data.

After these two studies are in hand, then the specific implementation of a particular automation technology (such as SCADA) can proceed through the familiar feasibility study, development of designs and specifications and on to system acquisition. Several other factors, which are often overlooked in the initial planning for a specific technology, are shown in Figure 1. Specific questions to be considered include:

1. How will the proposed new technology be integrated into the existing automation infrastructure at the utility?
2. How will future trends (such as technological improvements) affecting the implementation decision be tracked?
3. How will on-going maintenance be performed, and does existing staff have the needed capabilities to do so?
4. What will trigger the periodic review of both the long-range and short- to mid-range needs and opportunities of the utility?

All of these issues have parallels in T&D planning, but the effects are exacerbated by the particular characteristics of automation technologies.

Many of the key challenges that face utilities can be solved with the proper application of automation and information systems technologies. These systems can enable utilities to provide responsive, first-class customer service cost-effectively. Those utilities that target their resources to meet their strategic goals and effectively deploy automation and information systems technologies will likely gain significant cost savings and have the greatest potential to be the winners in the competitive marketplace.