

Market Focused Deployment of Technology

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Introduction

Models of technology deployment are becoming more diverse as the marketplace undergoes dynamic change. Changes such as the globalization of markets, intensifying competition, increasing consumer diversity and the progressive speed of technological innovations are profoundly altering the manner in which companies adopt and deploy technology. The robust business environment is driving companies to be more market-oriented in their approach to providing technological solutions.

Market-oriented technology deployment compels companies to reexamine how they research, develop, produce and market new technologies. The technology deployment process is becoming a more concurrent and integrated process, in order to successfully meet or exceed consumer expectations and maintain a desired market position. Looking ahead, there are several factors affecting market adoption of new technology. These factors imply that products and services should be:

- Cost and value-competitive -- must be of value to users, in cost and functionality
- Familiar and comfortable -- must "feel" reasonably comfortable and familiar
- Flexible, convenient, and controllable -- may provide new ways of using time and space and probably will be more utilitarian
- Compatible, enhanced, interactive -- will expand or enrich options, or improve the integration of varying technologies

These factors and marketplace changes are creating new methodologies within companies for linking the deployment of new technologies to the demands of the market.

There are at least three reasons why deployment of new technologies in the future must be market focused.

First, as the industry becomes more competitive with privatization and deregulation, it will be impossible to recover the cost of market failures of new technologies through the rate base. For example, only in a regulated monopoly could the Bell system afford such massive failures as picturephone services, videotex, and the phone centers. This does not mean avoiding the uncertainty of market behavior by not taking risks but instead focusing and listening to market signals prior to deployment of new technology. In short, BellSouth in the future will have to select and deploy new technologies not only based on productivity and cost displacement but also based on how they will benefit customers in the market place.

Second, at one time, markets were more homogeneous. It was relatively easy to divide the total market into two broad segments: business and residence. Deployment of new technology was, therefore, relatively easy both with respect to modeling the market behavior and forecasting its level and rate of adoption. Markets are no longer homogeneous and market diversity is on the rise for both the business and the residence customers. Enormous growth of small business (especially self-employed owner managed businesses) on the one hand, and interexchange carriers on the other hand, have greatly increased the diversity of business customers. Similarly, age diversity, life style diversity, ethnic diversity and income diversity among the residential customers has increased to such a level that there is no more a typical family. Mass consumption society has been displaced by a niche consumption society. Therefore, it is virtually impossible to design and deploy technology for the "average" customer. Instead, BellSouth needs to target and experiment in the market place and learn from both market successes and market failures.

Third, the digital world of electronics has literally created convergent applications which were impossible in the electromechanical age. Today, it is possible to offer integrated multimedia services on a common technology platform ranging from virtual private networks and bandwidth on demand to virtual reality. The Future models of technology adoption, therefore, must take into account the enormous potential of new markets created by this technology convergence. For example, who would have thought of a runaway success of Smart Toilet (mechanics and electronics), Nintendo video games (graphics, voice and computing) or desktop publishing (text, graphics and processing).

Models of Technology Deployment

In this paper, we will suggest that there are at least four types of market focused technology adoption models. Which model to select and deploy depends on whether customer needs are homogeneous or diverse and whether the technology application is stand alone or integrated. In

telecommunications, one can argue that "connectivity" is a universal customer need whereas "convenience" is a discretionary and therefore diverse need (want).

Similarly, POTS (Plain Old Telephone Service) is a stand alone or isolated technology application but ISDN (Integrated Services Digital Network) or videotex is an integrated technology application.

The following matrix represents the four market focused models of technology adoption and their appropriate selection and utilization.

| | | | |
|-------------------------------|-------------|-----------------------------------|----------------------------------|
| | | Market Needs | |
| | | Homogeneous | Diverse |
| Technology Application | Convergent | System Integration Model | Market Articulation Model |
| | Stand Alone | Innovation Diffusion Model | Mass Customization Model |

1. Innovation Diffusion Model

The innovation diffusion model is probably the most widely known market focused model. It provides a logical explanation for the typical diffusion cycle of new technology (slow start, rapid take off and eventual plateau) by suggesting that innovators and early adopters are the opinion leaders (lead users) who influence the majority users by their action and influence. The innovation diffusion model presumes that customers have universal needs and a stand alone product or process technology can satisfy that need. Examples include prescription drugs for diseases, new farming practices and appliances. In telecommunications, past examples would include touchtone and basic exchange services. In the future, it might include video dial tone, mobile services, and calling card services. The innovation

diffusion model presumes that as the cost of the innovation comes down over time, more and more people will be able to afford it, and eventually it becomes universal. Thus, what began as a luxury becomes a necessity over time. Obvious examples include automobiles, appliances and telephones, watches, and calculators. The "trickle down" approach to technology deployment starting with the high paying government and large business customers and eventually offering the technology to the consumer customers make perfect sense in this situation.

2. Market Articulation Model

As customer needs become more and more divergent and at the same time technology applications require more and more convergence, it becomes increasingly necessary to utilize the market articulation model. The latter presumes that technology fusion offers enormous new market opportunities which can only be learnt by offering a large variety of innovations and learning from the way markets and customers select or discard varieties of innovative combinations. The best example of this is the recent introduction of laptop computers by Hitachi with its enormous combinations of functions and features. Similar examples include engineering workstations, memory chips, and CD-ROM. As communications and computing technologies converge in the future, it is inevitable that BellSouth will have to utilize the market articulation model to new technology deployment. These include information services, voice mail services and CLASS services. In all these instances, BellSouth will have to offer a large variety of offerings, learn from market choices, and improve the performance cost over time.

3. Mass Customization Model

Mass customization refers to offering custom products/services on standard processes. It is an excellent approach to deployment of a stand alone technology to a diverse market. For example, Motorola has successfully used mass customization in the pager business and offers as many as two million combinations based on standardized modules. Each order is a custom order with respect to size, shape, color, functionality and logo. The mass customization model is ideal in telecommunications for most infrastructure technologies; for example, vertical services. Specialized network services offered to interexchange providers and information service providers are also examples of mass customized services. Offering mass customized services will help to strengthen BellSouth's competitive position in the increasingly deregulated telecommunications market.

4. System Integration Model

The system integration model is very useful when the application requires convergence of multiple technologies but the market need is homogeneous. The best examples of successful system integrations are personal computer hardware and software platforms for specific applications as well as computerized reservation systems (CRS) such as the SABRE. More recent examples include portable scanner technology: market needs are more homogeneous but their application requires integration of different technologies.

The system integration model is likely to be extremely important in the future for BellSouth as it offers integrated services such as ISDN, digital wireless services, and interactive video services.

What are the implications of new technology deployment for BellSouth? First, it must deploy new technology based on a market focused approach to grow the markets and recover its investment more rapidly. Second, it must select the right market focused model depending on whether technology is stand alone or integrated and whether market needs are homogeneous or diverse. Finally, as market becomes more divergent and technology becomes more convergent over time, it must learn the market articulation approach to technology deployment. It means offering lots of little innovations in rapid succession. Some of them will fail and others will succeed in the market place. It is not a question of avoiding market failures but instead minimizing the magnitude of any one market failure. Future creation and maintenance of a competitive advantage requires that BellSouth be highly responsive to market needs. BellSouth will need to take a long-term market approach to technology deployment and bolster its technology strategy appropriately to maneuver and leverage from marketplace dynamics.