Trends in the Use and Management of Application Package Software

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The use of application package software to meet information system needs has grown dramatically in the last decade. The time and cost savings available from the use of packages have overwhelmed traditional objections to their adoption. This paper reports on characteristics of package use based on a survey sample of U.S. firms using packages and in-depth interviews with I/S managers. The results show that many firms now use packages to meet line-of-business, or mission-critical system needs, as well as more generic, backoffice requirements. Furthermore, a significant proportion of sample firms adopt packages as part of an overall strategy to implement much of the core of I/S functionality in packages. An explanation of the forces driving greater use of packages is presented, and implications of these trends are discussed.

This paper investigates the recent growth in application package software adoption and use and the implications of this trend for the future of application packages. Packages have provided sizeable benefits to the companies that have adopted them, and the bright future of application packages promises further gains to the companies that rely heavily on vendor developed software to meet information system needs.

Application packages, or dedicated packages as they are sometimes called, are vendor-developed software for use in the recording, storing, processing and reporting of information in specialized and specific functional areas of a business, such as accounting systems, inventory systems, banking systems and the like. This definition excludes data center programming and utility software like compilers and security software. It also excludes ‘tool’ type software such as statistical packages, spreadsheets, and general purpose database software.

Not long ago the MIS literature on application packages emphasized the adoption and implementation problems that inhibit package use (Gross & Ginzberg, 1984; Lynch, 1984; Lynch, 1985; Lynch, 1987; Martin & McClure, 1983). Only the most recent research assumes a more positive stance.

The Survey

As background for this paper we surveyed a nationwide sample of organizations on their use of application packages and conducted in-depth interviews with nine I/S managers and consultants with extensive experience in package adoption and implementation. The usual questionnaire development and testing procedures were followed, and the questionnaire was mailed to a sample of I/S Directors chosen from the Directory of Top Computer Executives (Applied Computer Research, 1988) in 1988.

One hundred and one useable questionnaires were received. Eighty-nine of the responding companies used application packages at the time of the survey. Responses came from a wide variety of industries with manufacturing (32%) and financial (23%) most heavily represented. About a third of the sample reported annual revenues of $100 million or less, and a third had revenue of more than one billion.

Most responding firms had installed four or more application packages in major systems functions at the time of the survey and some had installed as many as seven. Expenditures on package acquisition, modification and maintenance increased an average of 184% over the previous five years, and sample companies had implemented an average of 44% of their major application systems in packages at the time of the survey. These organizations had seen explosive growth in the use of packages in the 1980s.

Forces Driving Greater Use of Application Packages

The interviews and survey results give insights into the demand and supply side factors accounting for this rapid change.

Demand Side Factors

The use of application package software can be seen as a way to leverage I/S resources and cut the time and cost of systems delivery by offering a competitive alternative to internal systems development (Brooks, 1987). Respondents to the survey were asked to rank factors accounting for greater package use. A substantial majority (60% or more) ranked cost savings and greater timeliness in meeting user needs as the first or second most important factor driving greater package use. (See Table 1.)

However, packages also have disadvantages. Table 2 shows that over half the survey respondents found the first or second greatest disadvantage of packages to be poor fit to user requirements or difficulty interfacing a package to other systems. A third of the sample companies rated package runtime inefficiency as the first or second greatest disadvantage. The results of the survey suggest that

| (Percent of respondents ranking factors first or second in importance on a 5 point scale) |
|---------------------------------|------------------|------------------|
| More cost effective than in-house development | 72% |
| Meet needs in a more timely fashion | 62% |
| Improved package capabilities and user interface | 27% |
| Users willing to trade fit for timely delivery | 20% |
| Better vendor service | 6% |
| **Table 1: Factors Accounting for Increased Application Package Use** |

| (Percent of respondents ranking factors first or second in importance on a five point scale) |
|---------------------------------|------------------|------------------|
| Poor fit to user requirements | 60% |
| Difficulty interfacing with other systems | 55% |
| Poor runtime efficiency | 32% |
| High maintenance costs | 26% |
| Infrequent/untimely enhancements | 20% |
| **Table 2: Disadvantages of Application Packages** |
some traditional objections to packages are still
corns but have given way to cost and schedule
imperatives.

Our in-depth interviews with I/S managers
revealed that firms in some industries have adopted
packages for competitive reasons, and twenty-nine
percent of the survey respondents using application
packages had a strategic plan or systems architec-
ture that guided the adoption of packages. Ex-
amples are banks which have adopted packages for
implementing demand deposit and check clearing
systems and manufacturing firms which now use
vendor produced computer aided manufacturing
coordination and control systems. Competitive
timeliness and quality in the delivery of product and
customer service depend on these systems. Vendors
offer packages that incorporate industry stan-
dard methods for banking and manufacturing and a
level of functionality that most I/S departments
could not produce for the same price.

Supply Side Factors
The increased range, quality, and functionality
of vendor products and services must also be given
a share of the credit for rapid growth in the use of
packages. Our respondents indicated that, in the
1970s, vendors overcame some restrictions to
modification of packages by designing parameter
driven software and software with easy to modify
user interfaces and easy to use report writing facili-
ties. Package software vendors also grew more
adept at supporting their products in every area,
from training users to maintaining code.

The evolution of the application package mar-
ket has followed a path that is made clearer by use
of Porter’s familiar competitive strategies grid (Por-
ter, 1985). (See Figure 1).

In its infancy, in the 1960s and early 1970s, the
application package market was largely confined to
systems that provided the most generic backoffice
functions. About ten percent of the survey respon-
dents acquired a first application package before
1975 and nearly all of these were accounting or
human resource systems. Accounting and human
resource systems have, of course, great commonal-
ity across firms. These were the markets first
targeted by software houses. The packages aimed at
a broad market but had limited or narrow function-
ality. This market segment corresponds to the lower
left hand corner of the strategy grid — cost reducing
applications in narrow functional segments of the
market.

However, many companies found packages
unacceptable, even for generic functions like ac-
counting, because the details of their existing ac-
counting systems and their user’s stated require-
ments differed considerably from the capabilities of
the packages in the marketplace. In response ven-
dors added capabilities to their package products
that met more and more of the needs of their poten-
tial customers. This development represents an
expansion of the market into the upper left quadrant
of the grid. Packages, by offering more options
became attractive across whole industries and indus-
try clusters. Sixty-six percent of the sample
firms first adopted accounting or human resource
systems. Most firms in the sample took this action
in the late 1970s or early 1980s when packages
evolved into products that firms of almost any size
in almost any industry could find attractive.

In the 1980s competitive pressures intensified.
Vendors began developing products that targeted
front office or line-of-business functions in selected
industries. These were often regulated or mature
industries with standard ways of performing line-
of-business functions. Adopting packages as a way
of reducing the costs of providing information sys-
tems functions became a widespread response to
competitive pressures. The survey shows that by the mid-1980s nearly half the packages being adopted addressed some line-of-business need. Banking and production systems were the most common. This vendor strategy falls into the upper right hand corner of the strategy grid — application packages serving common line-of-business needs in a specific industry.

The remaining quadrant of the strategy grid, the lower right, has not yet been targeted by package software vendors. By definition this is the quadrant with little or no economies of scale — needs differentiated by the characteristics of individual firms. Perhaps the lack of economies of scale will prevent the development of packages for this segment.

In addition to differentiating their products by competitive category, our respondents indicated that software houses have become increasingly adept at competing on other grounds as well. These methods include staying at the forefront of industry practice, frequently upgrading their products, providing responsive support and maintenance capabilities, providing good user manuals and superior training, and creating user groups that have real power over the future migration of the package. Upgrades, training, documentation or maintenance were mentioned by ten percent or more of the responding firms in the survey as being one of the top five benefits of adopting packages.

Implications for the Future of Application Package Use

There has been no let-up in the demand and supply pressures outlined above, and the growth in package adoption and use will continue at a rapid pace in the decade of the 90s. We foresee the following as desirable and inevitable changes in the use and management of package software in the future:

- Fewer packages will be modified by companies to meet idiosyncratic company needs, instead vendors will provide greater customization through parameter driven software, and companies using packages will modify their business functions to fit package function. This reduces the cost of package adoption and positions the company to receive future versions of the package without further rounds of costly modification.
- Rather than consider package adoption on an ad hoc basis, system-by-system as each new system need arises, more managers will consider packages as a strategic response to overall information system needs, and companies, with the help of I/S managers, will devise strategies for integrating many packages into a systems architecture.
- Managers will use packages to implement most of the core backoffice functions of the business and many line-of-business or competitive functions. As a result, the need for I/S personnel will be less than it is in today’s environment in which many systems are developed and maintained in-house.
- As centralized I/S functions are decentralized to user areas, packages will be welcomed by central I/S managers with smaller application development budgets and staffs, and results-oriented user-managers will also adopt packages for their time and cost saving advantages.
- In larger companies that meet a substantial portion of their information systems needs through packages, the roles of I/S Department managers and personnel will evolve toward those of moderators and facilitators — screening vendors, helping users select between competing vendor offerings, providing interfaces between packages, and interfacing with vendors in the service and maintenance of their products. In smaller companies that rely heavily on packages, the I/S Department can be reduced to a few persons with occasional help from outside consultants.

The future bodes well for application packages. Together, managers of user areas and I/S managers will find creative ways of applying package solutions to both backoffice and competitive, line-of-business information needs. In doing so they will reduce I/S costs and increase I/S timeliness without incurring penalties in I/S quality.
References


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