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

<table>
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<tr>
<th>Table 1: Factors Accounting for Increased Application Package Use</th>
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<td>(Percent of respondents ranking factors first or second in importance on a 5 point scale)</td>
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<tr>
<td>More cost effective than in-house development</td>
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<tr>
<td>Meet needs in a more timely fashion</td>
</tr>
<tr>
<td>Improved package capabilities and user interface</td>
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<tr>
<td>Users willing to trade fit for timely delivery</td>
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<td>Better vendor service</td>
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<th>Table 2: Disadvantages of Application Packages</th>
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<td>(Percent of respondents ranking factors first or second in importance on a five point scale)</td>
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<tr>
<td>Poor fit to user requirements</td>
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<tr>
<td>Difficulty interfacing with other systems</td>
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<tr>
<td>Poor runtime efficiency</td>
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<tr>
<td>High maintenance costs</td>
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<td>Infrequent/untimely enhancements</td>
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some traditional objections to packages are still concerns 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 architecture that guided the adoption of packages. Examples 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 standard 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 facilities. 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 market has followed a path that is made clearer by use of Porter’s familiar competitive strategies grid (Porter, 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 respondents 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 commonality across firms. These were the markets first targeted by software houses. The packages aimed at a broad market but had limited or narrow functionality. 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 accounting, because the details of their existing accounting systems and their user’s stated requirements differed considerably from the capabilities of the packages in the marketplace. In response vendors added capabilities to their package products that met more and more of the needs of their potential 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 industry 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 systems functions became a widespread response to

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**Figure 1: Porter’s Generic Strategies**

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<th>Competitive Scope</th>
<th>Competitive Advantage</th>
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<tr>
<td>Wide</td>
<td>Cost</td>
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<tr>
<td>Narrow</td>
<td>Differentiation</td>
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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 differ-
entiated 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 increasing adept
at competing on other grounds as well. These meth-
ods include staying at the forefront of industry
practice, frequently upgrading their products, pro-
viding responsive support and maintenance capa-
ibilities, 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 ven-
dors 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 pack-
ages 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 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 develop-
ment 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 pack-
ages, 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 inter-
face with vendors in the service and mainte-
nance 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 solu-
tions 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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