

SECTION I

EXECUTIVE SUMMARY

The Packaging Machinery Aftermarket – a Significant Entity

U.S. domestic market expenditures for parts and service associated with in-place packaging machinery amounted to approximately \$2.98 billion¹ in 2004, of which parts represented \$2.5-2.7 billion and service \$333-430 million (Table S-1) – according to the findings of this research². The original packaging machinery manufacturers and their authorized distributors garnered approximately 60 percent of the \$2.98 billion total, thereby placing their combined share at an estimated \$1.79 billion. Alternative parts and service suppliers – largely non-OEM parts replicators, local machine shops, providers of common or commercial parts, and independent service firms – accounted collectively for the 40 percent balance, valued at roughly \$1.19 billion. The significance of the packaging machinery aftermarket – in addition to its acknowledged magnitude – is the fact that parts and service

TABLE S-1
ESTIMATED U.S. DOMESTIC MARKET EXPENDITURES FOR
PACKAGING MACHINERY PARTS AND SERVICE IN 2004

	(Billion Dollars)
Parts	\$2.500 - 2.700
Service	0.333 - 0.430
TOTAL	\$2.833 - 3.130

Source: PMMI

operations of most packaging machinery manufacturers are responsible for a disproportionately high share of the machinery industry's annual profits. It therefore seems reasonable that machinery manufacturers could proactively focus greater attention on their respective parts and service markets in the interest of securing a meaningful portion of the 40 percent currently held by the alternative suppliers.

¹ Mid-point of the \$2.833-\$3.130 billion range estimate (Table S-1)

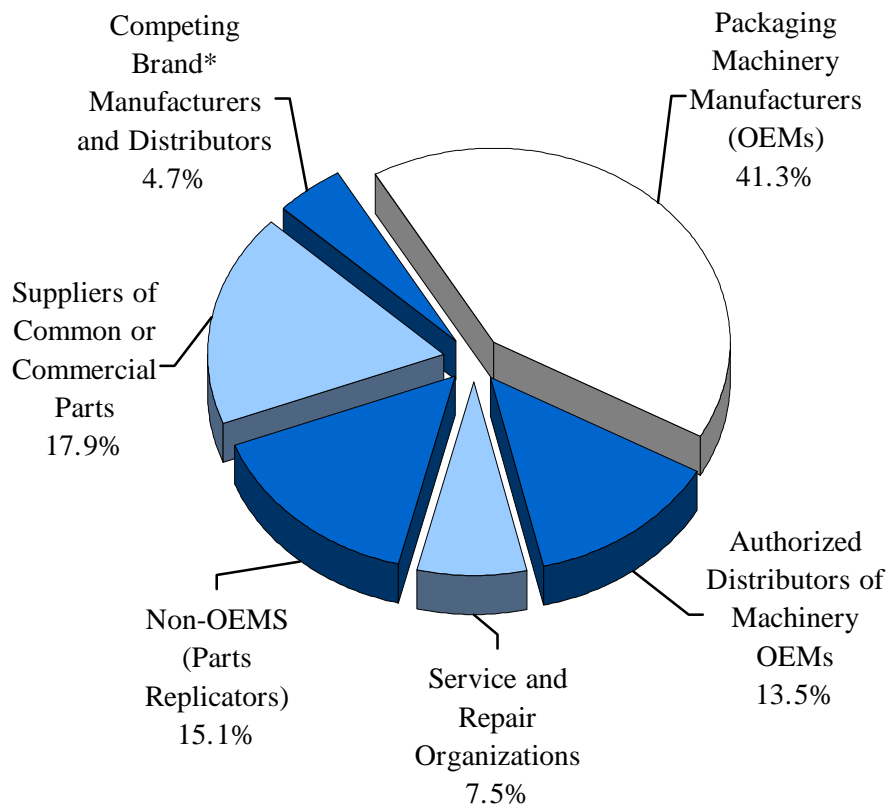
² Conducted exclusively for PMMI by Industrial Research Associates, LLC, an independent market research firm. The findings are based on data furnished by 460 respondents (combination of mailed questionnaires and telephone interviews) representing 1,191 plants and 17,934 packaging machines operating in the U.S.

Where the Parts Dollars are Now Going – an Overview

As Figure S-1 illustrates, several groups and types of suppliers actively participate in the domestic packaging machinery parts market. While the packaging machinery manufacturers (OEMs) and their authorized distributors together retain the largest combined share, others – particularly manufacturers of common or commercial parts and non-OEMs (parts replicators) – maintain a significant presence as well. The 60:40 ratio (OEM versus alternative suppliers) is built upon a complexity of segmented market shares – all defined and expanded upon in the report's Detailed Findings.

FIGURE S-1

**U.S. 2004 DOMESTIC SALES OF PACKAGING MACHINERY
PARTS BY PRINCIPAL TYPE OF SUPPLIER
(Percent of Total Dollar Value)**



*Competing-Brand Manufacturers and Distributors: OEMs and distributors that sell parts for competing brands of machines

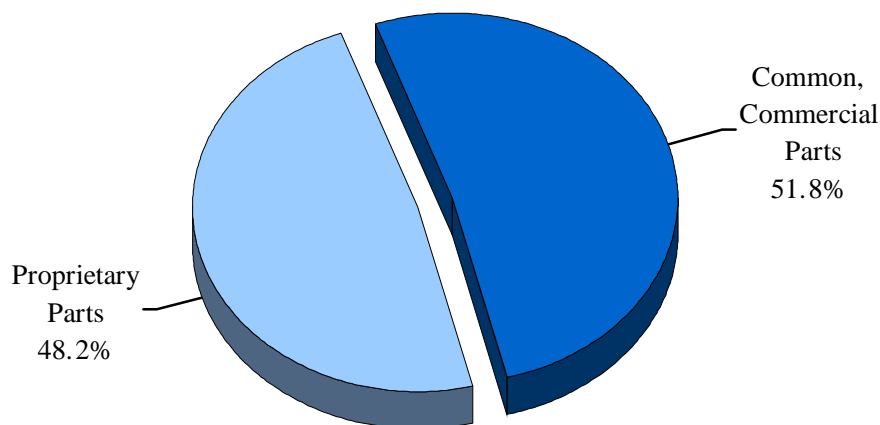
Source: PMMI

Proprietary Parts versus Common or Commercial Parts

Packaging machinery parts are classified – for purposes of this report – according to two basic categories: (1) proprietary parts and (2) common or commercial parts. Proprietary parts, which are exclusive to a particular brand and/or model of machine, including such items as *formers, augers, nozzles, funnels, hoppers, shafts, hubs, rings, baffles, feeders, star wheels, timing screws, connectors, etc.*, represent the heart of the machinery manufacturers' parts business and profit center. On the other hand, common or commercial parts – typically outsourced by the packaging machinery manufacturers from other suppliers and incorporated into their machines – are more widely available in the general marketplace and thus generally offer less of a profit potential for the packaging machinery manufacturers. These parts include, among others: *motors, controls, cylinders, valves, solenoids, brakes, clutches, PLCs, servos, circuit boards, computer components, couplings, gears, etc.* As Figure S-2 indicates, common commercial parts accounted for 51.8 percent of aggregate packaging machinery parts sales dollar volume in 2004, and proprietary parts represented the 48.2 percent balance. With the increasing use of digital servo motion control, machine technology is undoubtedly moving toward more electronic motion and less mechanical action, thereby resulting in the

FIGURE S-2

**U.S 2004 DOMESTIC MARKET EXPENDITURES FOR
PACKAGING MACHINERY PARTS BY PRINCIPAL
CATEGORY OF PART
(Percent of Total Dollar Value)**



Source: PMMI

reduced use of certain kinds of common or commercial parts, such as gearboxes, couplings, sprocket drives, bearings and supports, pillow blocks, and a variety of others. Inasmuch as electronic motion control parts tend to fail less frequently than mechanical motion parts, which are inherently subject to more wear, the frequency rate of common parts *replacement* could be slowing. However, the trend is also resulting in the use of fewer proprietary *primary motion* parts as well, such as shafts, cams and levers. Nevertheless, the use of certain basic proprietary parts, particularly formers, augers, nozzles, funnels, hoppers, rings, baffles, feeders, star wheels, timing screws, and connectors, etc. will remain essential to basic machinery operation. With regard to these findings, it is most important to emphasize that the common parts-proprietary parts ratio – varies widely by type of machine.

OEMs Maintain Lion's Share of Proprietary Parts Market

In 2004, North American packaging machinery manufacturers accounted for 77.3 percent of the proprietary parts sold for their existing packaging machines – either through their own direct sales representation or through their service organizations, distributors and other resellers (Figure S-3). The non-OEMs – essentially parts replicator firms that commercially manufacture parts on an ongoing basis – were responsible for 16.3 percent of the total– also

TABLE S-2
PRINCIPAL REASONS END-USERS ORDER NON-OEM PACKAGING
MACHINERY PROPRIETARY PARTS

(Sample's Rating of Each Factor's Effect on Their Decision: 0 = No Effect, 8 = Major Effect)

Factor	Average Rating (Based on Scale of 0 to 8)	Percent Rating Factor 7 or 8 out of 8 (%)
They Give Us Faster Deliveries than the OEMs	6.8	69.6
Their Prices are Lower than the OEMs'	6.8	65.5
They Give us Better Service on Obsolete Parts	6.0	52.3
They Respond Quicker to Our Inquiries than OEMs	6.0	41.4
Some Parts are Better Quality than the OEMs'	5.4	35.5
They Care More About Our Business than the OEMs	5.3	31.9
Their Parts are Upgrades in Performance Vs. the OEMs	5.0	27.6
They are a Single Source for Several Machine Brands	4.8	24.7

Source: PMMI

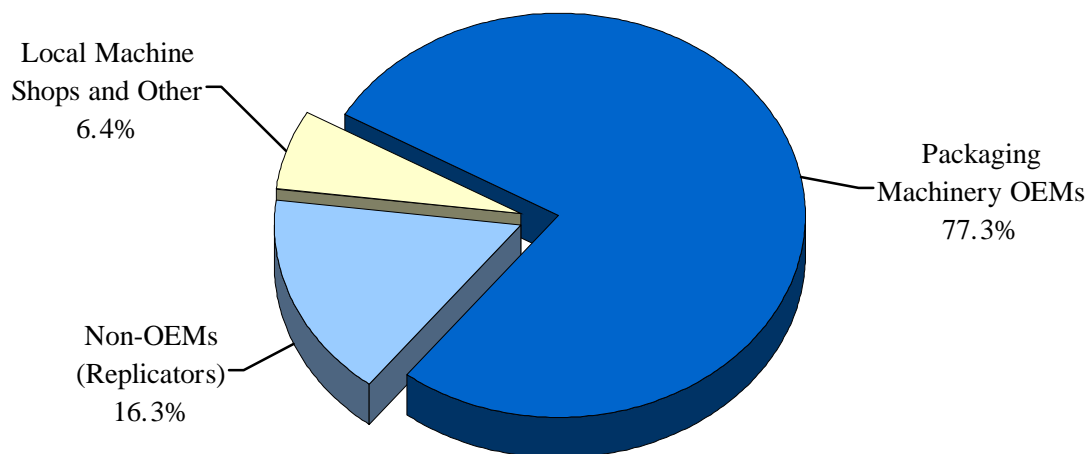
through direct sales, distributors, service firms, and other resellers. And the 6.4 percent balance was made up largely of machine shops contracted to furnish or replicate parts for end-users on a custom basis. Technically they can also be considered non-OEMs, but for purposes of this research, it was deemed appropriate to differentiate them from the rest.

Reasons End-Users Go to Non-OEM Sources for Proprietary Parts

Pick any category of machinery and market served and invariably the two most widely cited issues of dissatisfaction will be: (1) parts prices are too high and (2) delivery is too slow. It goes without saying that the packaging machinery industry is no exception. In line with that axiom, it was found that customer dissatisfaction with packaging machinery OEMs' prices and delivery *have been* the primary motivating factors causing them to look elsewhere for parts (Table S-2). It is important to emphasize, however, that the findings also revealed other factors exerting a strong influence on those decisions, either separately or in combination. They include: "Better Service on Obsolete Parts by the Non-OEMs", "Quicker Response to Inquiries", "Better Quality of Some Parts", "The Impression of Caring More about

FIGURE S-3

**U.S 2004 DOMESTIC SALES OF PROPRIETARY
PACKAGING MACHINERY PARTS BY PRINCIPAL
SOURCE OF SUPPLY
(Percent of Total Dollar Value)**



Source: PMMI

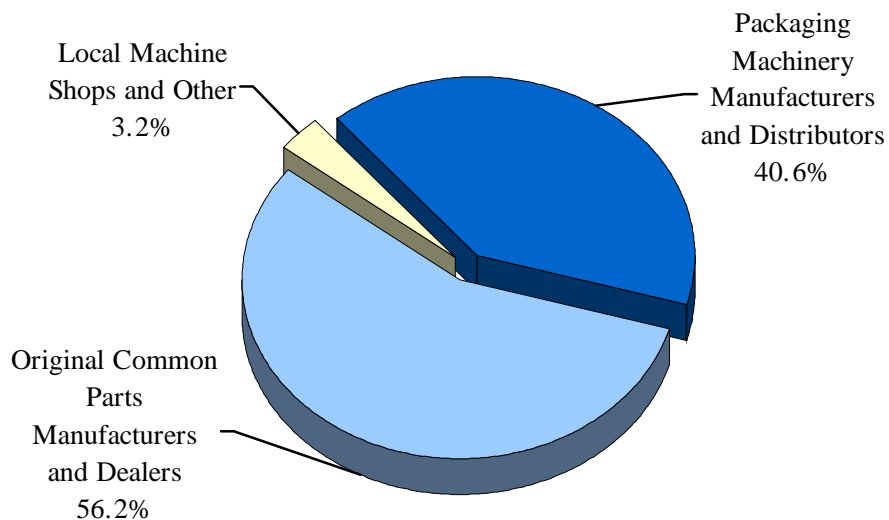
Customers' Business", among others. Although price and delivery advantages may initially afford non-OEM suppliers a "foot in the door opportunity" with end-users, research findings have conclusively affirmed that once non-OEMs gain entrance, many have been able to solidify their credibility by demonstrating proficiency beyond merely offering lower prices and faster deliveries.

Machinery OEMs on Short End of Common/Commercial Parts Market Share

According to the projected data, packaging machinery manufacturers and their distributors captured approximately 40.6 percent of the total 2004 market (in \$) for common parts used on packaging machinery in the U.S. (Figure S-4). Conversely, the majority of the business (59.4%) went to other suppliers. The parts and components OEMs, (e.g. manufacturers of motors, cylinders, valves, controls, PLCs, etc.) and their dealers accounted for 56.2 percent and local machine shops and other miscellaneous suppliers garnered the 3.2 percent balance.

FIGURE S-4

**U.S 2004 DOMESTIC SALES OF
COMMON (COMMERCIAL)
PACKAGING MACHINERY PARTS BY PRINCIPAL
SOURCE OF SUPPLIER
(Percent of Total Dollar Value)**



Source: PMMI

Reasons End-Users By-Pass Machinery Manufacturers for Common Parts

It should come as no surprise to anyone close to the industry that end-users order common parts directly from the common parts manufacturers and their dealers expressly because: (1) their prices are generally lower than those charged by the machinery manufacturers and (2) their deliveries are faster (Table S-3.). By their very nature, common parts are largely outsourced by the OEMs to be incorporated into their respective machines and are thus considered “genuine”. Many end-users require the packaging machinery manufacturers to provide a cross reference of their part numbers with the original common parts manufacturers’ numbers so they may source the parts directly. As essentially parts resellers, many of the machinery manufacturers mark up the common parts for their machines to price levels considerably higher than those typically charged by the common parts manufacturers or dealers. While follow-up probing of respondents revealed that a sizable portion of end-users appear willing to pay a slight premium for common parts supplied by the machinery manufacturers, they are adamant about not paying the inordinately high prices that many of the OEMs charge.

TABLE S-3
PRINCIPAL REASONS END-USERS ORDER PACKAGING MACHINERY
COMMON PARTS FROM ALTERNATIVE SUPPLIERS

(Sample’s Rating of Each Factor’s Effect on Their Decision: 0 = No Effect, 8 = Major Effect)

Factor	Average Rating (Based on Scale of 0 to 8)	Percent Rating Factor 7 or 8 out of 8 (%)
Their Prices are Lower Than the OEMs’	7.1	76.3
They Give Us Faster Deliveries than the OEMs	6.6	70.1
They Respond Quicker to Our Inquiries than OEMs Do	5.9	48.6
They are a Single Source for Several Mach’y Brands	5.2	37.6
They Care More About Our Business than the OEMs	4.8	28.4

Source: PMMI

Customers’ Attitudes, Priorities and Concerns

In examining customers’ attitudes, priorities and concerns relating to packaging machinery parts and service, respondents were asked several sets of questions presented in a rating-scale

format designed to cover pricing, parts order service, parts quality, parts availability/delivery, technical expertise and service repair capabilities. The following summaries highlight the findings.

The Impact of Price

Approximately 61 percent of the sample's companies consistently and actively seek the lowest prices on all the parts they order for their existing packaging machinery as their primary consideration; however, they also genuinely weigh other factors in their decision, such as delivery, quality, etc. Another 31 percent indicated that their requirement of lowest price is limited to only common/commercial parts, and that they order proprietary parts – usually irrespective of price – strictly from the machinery OEMS or their distributors. Of the balance, 7.7 percent claimed that price generally plays a secondary role to such other factors as parts quality, parts availability, and service, while 0.4 percent reported buying only on the basis of low price.

Potential Influence of Parts Prices on New Machinery Decisions

The impact of parts pricing was found to extend beyond the mere issue of aftermarket sales, and into decisions involving selection of new packaging machinery. Over 21 percent of the sample's respondents reported that they always request a quotation from the machinery manufacturer on spare parts for the machine in question before making the decision to purchase the new unit. The majority – 55.3 percent – indicated that they *sometimes* request a preliminary spares quote. Only 23.6 percent stated that as a general practice they do not request such a quotation in conjunction with new machinery acquisition evaluations.

The Impact of Parts Availability and Speed of Delivery

As end-users seek to reduce the size of their replacement parts inventories in an effort to cut costs, they are exhibiting a greater tendency to depend more heavily on suppliers' inventories rather than on their own for both current and long-term parts needs. In effect, they want to count on their suppliers to deliver parts when promised so that replacements can be made on schedule. The largest number of respondents cited "*meeting delivery commitments*" as the leading delivery-related attribute sought in a supplier of packaging machinery (Table S-4).

Availability of Standard (Current Parts) Vs. Obsolete Parts

Customers generally expect to see standard parts regularly stocked in a supplier's inventory and available for immediate delivery, but they also recognize that obsolete parts may take longer to obtain. When asked how fast they'd like to receive standard parts, 73.2 percent of the respondents indicated a time frame of "next day", while 19.6 percent found 2-3 days acceptable and 7.2 percent judged over 3 days as OK. The average acceptable time overall was 1.7 days and the median one day. By contrast, however, the acceptable or preferred delivery time frame for obsolete parts was 7.3 days with a median of 7.0 days. Their acknowledgement of a longer lead time on obsolete parts procurement is reflected in the 6.4 out of 8.0 rating it received and the fact that only 59.3 percent of the respondents rated "quick delivery of obsolete parts" a 7.0 or 8.0 priority. With packaging machinery technology advancing at lightning speed, obsolescence is becoming more common even with relatively new machines. Therefore, as the new models replace older versions, parts for the older units are less readily available; consequently, this deficiency is causing an increasing number of customers to seek alternative sources of supply.

TABLE S-4
CUSTOMERS' PRIORITIES REGARDING PARTS AVAILABILITY
AND SPEED OF DELIVERY

(Sample's Rating of Each Factor's Effect on Selection of a Parts Supplier

0= No Effect 8= Major Effect)

Factor	Average Rating (Based on Scale of 0 to 8)	Percent Rating Factor 7 or 8 (%)
Meets Delivery Commitments	7.3	84.1
Fast Parts Delivery for Standard Parts	7.1	76.6
Quick Delivery of Obsolete Parts	6.4	59.3
Maintains Large Parts Inventory	6.0	47.7

Source: PMMI

Need for High Caliber of Parts Order-Service

End-users view parts order-service – the fundamental execution of parts orders and ancillary support services associated with the orders – to be almost as crucial as the issues of price and delivery. While this may appear simplistic and obvious, one might be surprised at how many suppliers overlook the basic tenets of serving customers well. As

Table S-5 indicates, 73.2 percent of the sample rated the factor of “*Quick Response to Parts Inquiries*” as either a 7 or 8 among their priorities. A number of respondents alluded anecdotally to the fact that many machinery and parts suppliers tend to lack a sense of urgency when it comes to handling parts inquiries. While inside people on the order desk may be able to furnish a simple parts quote comprised of a few standard items, their response to a more complex request (where they may have to reference a schematic or research a serial number) can sometimes stretch out to days or in extreme cases, even weeks. The factor of “*Good Emergency Order Service*” averaged 7.1 on the rating scale, and the largest proportion of respondents (79.2%) rated the factor either 7 or 8, reflecting customers’ growing obsession with the need for quick customer service – especially when a packaging line is down or facing the prospect of going down for want of a replacement part.

TABLE S-5
CUSTOMERS’ PRIORITIES REGARDING PARTS ORDER SERVICE

(Sample's Rating of Each Factor’s Effect on Selection of a Parts Supplier

0= No Effect 8= Major Effect)

Factor	Average Rating (Based on Scale of 0 to 8)	Percent Rating Factor 7 or 8 (%)
Good Emergency Order Service	7.1	79.2
Quick Response to Parts Inquiries	7.0	73.2
Quality and Completeness of Documentation	6.8	68.0
Ease of Placing and Tracking Orders	6.0	40.6
Good Follow-Up on Parts Order Status	5.7	39.3
Maintains Close Contact With Us	5.6	31.0

Source: PMMI

Significantly, customers consider the “*Quality and Completeness of Documentation*” (e.g., parts lists, manuals, etc.) to be extremely important as well. Clear, explicit, complete and easy-to-follow documentation can by itself lead to an improvement in customer service by allowing the end-user to be well informed in dealing with the supplier

The Issue of Parts Quality

As the array of alternative suppliers offering parts for packaging machinery expands, questions arise as to the quality and consistency of the parts available from the alternative

suppliers and how concerned end-users are about installing parts that may not be sanctioned by the machinery manufacturers. While the issue is confined largely to replicated proprietary parts offered by non-OEM suppliers, it also extends in some cases to common parts as well. Not surprisingly, most customers indicated that their leading priority in terms of parts quality is to *“receive parts of consistent quality manufactured within precise tolerances”* (Table S-6). Follow-up probing of respondents’ ratings revealed that for the most part and with only few exceptions, customers appear to be generally satisfied with the quality of parts they receive. The findings also revealed that *“assurance of the parts’ adherence to machinery manufacturers’ OEM standards”*, is uppermost in the minds of many customers as well. But customers also look to suppliers for *“improvements in the quality and functionality of the parts”*, which can translate into either longer mean time between failures (MTBF) or better machine operation or both. The importance that customers attach to parts innovation and improvement is also reflected in the high rating given to the factor of *“offers choices in parts materials and options”*. The findings produced anecdotal evidence of needs for higher grades of stainless steel in some parts as well as for hard coatings on others – such as on augers – to limit abrasive wear. Finally, but perhaps of utmost significance is the concern that any part furnished by other than the OEM *“will not void the manufacturer’s warrantee.”* This factor was rated a 7 or 8 by 63.7 percent of the sample and received an average rating of 6.5 out of 8.0. With some machines costing well into six figures, many customers are reluctant to jeopardize the manufacturer’s warrantee by installing less costly non-OEM parts.

TABLE S-6
CUSTOMERS’ PRIORITIES REGARDING PARTS QUALITY
(Sample's Rating of Each Factor’s Effect on Selection of a Parts Supplier
0= No Effect 8= Major Effect)

Factor	Average Rating (Based on Scale of 0 to 8)	Percent Rating Factor 7 or 8 (%)
Ensures Consistent Parts Quality and Tolerances	7.0	76.3
Offers the Assurance of OEM Standards	6.8	68.2
Strives to Offer Improved- or Better Performing Parts	6.6	63.3
Guarantees Parts Won’t Void Mfr’s Warrantee	6.5	63.7
Offers Choices in Parts Materials and Options	6.1	44.3

Source: PMMI

The Growing Importance of Technical Expertise and Service/Repair Capabilities

The essential link between a company's role as not only a supplier of machinery and parts, but also as a source of good technical assistance with the capability to perform complete machinery repairs was clearly brought out in the research. For as packaging machines become more complex, plant maintenance personnel are challenged to keep up with the technology; consequently, end-users are increasingly relying on their suppliers for assistance. The selection of a machinery and parts supplier can thus often hinge on the supplier's technical capabilities. As Table S-7 indicates, end-users rated *good technical assistance on parts* first "among their supplier selection priorities in that area, which was

TABLE S-7
CUSTOMERS' PRIORITIES REGARDING TECHNICAL EXPERTISE AND
SERVICE REPAIR CAPABILITIES OF THEIR SUPPLIERS

(Sample's Rating of Each Factor's Effect on Selection of a Parts Supplier

0= No Effect 8= Major Effect)

Factor	Average Rating (Based on Scale of 0 to 8)	Percent Rating Factor 7 or 8 (%)
Offers Good Technical Assistance on Parts	7.0	70.9
Possesses High Level of Machinery Expertise	6.8	72.5
Advises us About Retrofits and Upgrades	6.1	45.5
Offers Training on Repairs and Maintenance	6.0	46.7
Offers Complete Machinery Repair Capabilities	5.8	43.4
Provides 24 Hour Repair Service	5.6	45.1

Source: PMMI

followed closely by "*high level of machinery expertise*". And consistent with the growing use of retrofitting as a means of upgrading existing machinery with current state-of-the-art technology, respondents also indicated that "*being advised about retrofits and upgrades*" is also important to them, as is "*training on repairs and maintenance*."

Parts Installed in Conjunction with Contracted Service Work

Just over 34 percent of the sample's companies use service repair organizations to repair, maintain, retrofit or perform other work on their respective packaging machines. Conversely, 65.9 percent typically handle all of their own repairs and upgrades using in-house

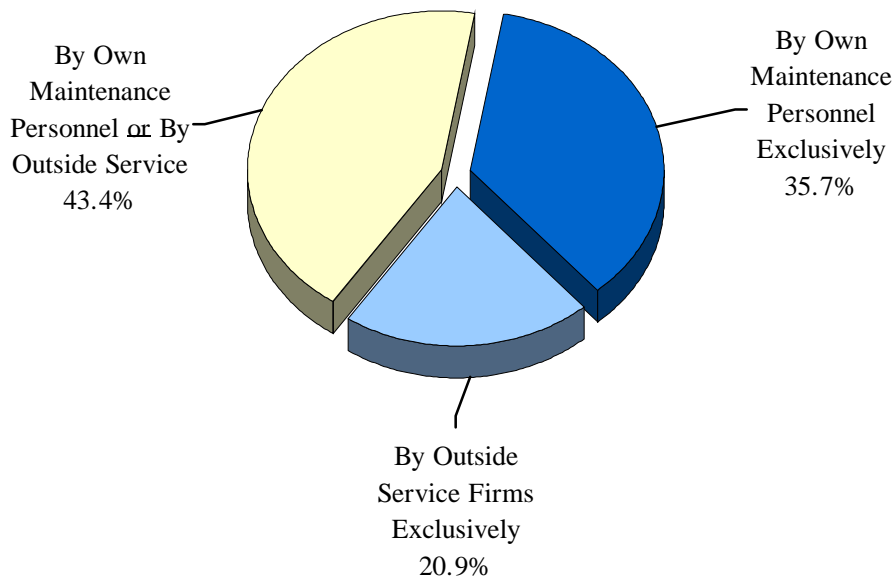
maintenance personnel. It should come as no surprise that the original packaging machinery manufacturers are responsible for the largest share of the contracted work on their respective brands of machinery – both for scheduled maintenance and routine and emergency repairs (47.8%) as well as overhauls and retrofits (51.7%). However, the second largest shares (25.0% for routine/emergency work and 23.1% for overhauls and retrofits) are held by independent service companies not associated with any packaging machinery manufacturer or distributor. Service departments of the original manufacturers’ distributor organizations ranked next, followed by service organizations of packaging machinery manufacturers or distributors working on competing brands of machinery (i.e. servicing a brand of machinery other than their own) with the smallest proportion of the volume.

Retrofitting Existing Packaging Machinery

With the rapid advance of packaging machinery technology, an increasing number of end-users have opted to retrofit their existing packaging machines with current state-of-the-art components as a means of upgrading without having to invest in a complete new machine.

FIGURE S-5

**HOW PACKAGING MACHINERY RETROFITS
HAVE BEEN IMPLEMENTED
(By Percent of Those Reported Retrofits Implemented)**



Source: PMMI

The growth of retrofitting has been facilitated by the proliferation of retrofit kits made readily available largely by the machinery manufacturers, but also of late, by alternative suppliers as well. The findings revealed that 59.1 percent of the sample's plants/companies had one or more existing packaging machines retrofitted within the past two years. As Figure S-5 illustrates, 35.7 percent of the respondents indicated that their own maintenance personnel exclusively carried out the retrofits, but a plurality – 43.4 percent – reported that in some cases their own personnel did the work and in others, outside service firms handled the retrofits. For retrofit installations performed only by outside service organizations, over 60 percent of the sample's respondents reported that the original packaging machinery's service organization and/or their authorized distributors did the work, Another 23.8 percent indicated that independent service firms installed the retrofit, and 15.9 percent revealed that the work on their machines was performed by service organizations of competing brand machines (e.g., a service organization from one brand of packaging machine working on a competing brand machine.) Of the respondents who indicated that their own maintenance personnel performed the retrofits (35.7% exclusively + 43.4% by either own personnel or outside service), 58.2 percent reported that they used *retrofit kits* to do so, of which 74.7 percent were supplied exclusively by the original packaging machinery manufacturers.

Decision Makers in the Selection of Parts Suppliers

While the influence of departments and/or individuals in decisions involving selection of parts suppliers tends to vary from one plant to another – often as a function of plant size – the findings nonetheless revealed certain patterns worth noting. As Table S-8 indicates, the largest number of respondents (54.6%) identified maintenance as having the most influence, followed by engineering (23.4%) and then by upper management (8.3%) – the latter reported principally by respondents of smaller firms. While one might rightly wonder about the relatively low percentage-mention of purchasing, there is an explanation. The question asked respondents to identify which department has the most say in these decisions. Inasmuch as maintenance and engineering are charged with keeping the plant running and rely heavily on their suppliers to ensure that machinery remains operational, they have a major stake in selecting which suppliers are used. No doubt, however, purchasing exerts some degree of influence, especially involving the issue of price.

TABLE S-8
RELATIVE INFLUENCE IN SELECTION OF PARTS SUPPLIERS AND SOURCE
OF PARTS BY PLANT/COMPANY DEPARTMENT

(Percent of Sample)

<u>Department</u>	<u>Has Most Say in General Selection of Packaging Machinery Parts Suppliers</u> (%)	<u>Has Most Say in Decisions on Whether to Use Non-OEM Parts</u> (%)
Maintenance	54.6	61.8
Engineering	23.4	21.7
Production	6.8	6.2
Upper Management	8.3	4.6
Purchasing	5.9	3.7
Corporate/Other	1.0	2.0
TOTAL	100.0	100.0

Source: PMMI

The Use of Blanket Orders for Parts Requirements

Based on a projection of the data, 17.3 percent of U.S. companies/plants order packaging machinery parts through some type of blanket order arrangement. And of those companies, blanket orders accounted for an average of 25.2 percent of their annual expenditures for packaging machinery parts. Moreover, a large proportion of the companies using blanket orders (44.2%) see its use is growing.

The Use of EDI to Order Parts for Packaging Machinery

Only 10.5 percent of the sample's companies/plants order parts for packaging machinery via an EDI (Electronic Data Interchange) system. Of those, 15.2 percent indicated that they *require* suppliers to use their EDI in processing parts orders, but 54.4 percent felt it important that suppliers be capable of working with their EDI system, but not required, (i.e., it nevertheless would be a plus.)

The Use of Suppliers' Internet Web Sites to Place Parts Orders

Over half the sample's respondents (51.0%) currently order some portion of their needed packaging machinery parts on suppliers' Internet web sites. Certain of the respondents commented that the web sites are useful to them only if they know exactly what they are

looking for; otherwise, they prefer to place their order with a “live person” who can walk them through the process. But 28.3 percent of those currently ordering on the Internet consider the benefit “significant,” while a plurality (44.1%) assesses it as a “moderate” benefit. Despite the somewhat lackluster numbers, it is evident that the need for suppliers to make the option available will no doubt increase progressively with time.

Parts Inventories Maintained by End-Users

Respondents were asked to estimate the size of the parts inventory they maintain in-house for their existing packaging machines as an approximate percent of their total annual expenditures for packaging machinery parts. Of the total sample, only 2.4 percent reported that they do not maintain any inventory of parts in house, and thus rely entirely on their suppliers for their requirements. As for the 97.6 percent of companies that do maintain a parts inventory, the average amount was 29.9 percent of their annual \$ usage of parts, which underscores the degree of dependence that end-users place on their suppliers’ inventories. Nearly a third– the largest single group – maintain an inventory equivalent to roughly 11-25 percent of their annual usage.

End-Users Move to Cut Spending for Packaging Machinery Parts

As part of the widespread efforts among end-users to reduce operating costs and improve plant efficiencies, maintenance procedures and operating expenditures associated with packaging machinery have clearly been targeted. Table S-9 lists the various steps that end-users are taking to cut costs and reduce inventory size. The largest proportion (54.9%) of the sample (of those implementing cost-cutting directives) reported having parts made quickly by local machine shops when needed; but the most widely adopted *cumulative* step reported is the shifting of responsibility for inventorying parts away from their own facilities and onto various parts suppliers. Other important steps include the institution of a better inventory control system (47.9%) and going out to more parts suppliers for parts quotations (30.3%). It is important to emphasize that most respondents indicated more than one step having been implemented by their respective plant(s). Of all the steps taken, perhaps the most prolific has been the establishment or upgrading of preventative maintenance programs. As Table S-9 also indicates, 48.6 percent of those required by directive to cut costs cited **preventative maintenance as a key initiative**. The findings further revealed that 59.6 percent of the

entire sample's companies currently have had a preventative maintenance program of one sort or another in effect. The significance of preventative maintenance as a cost-cutting initiative is that end-users typically look to the machinery manufacturers for guidance on maintenance procedures for their machinery. Respondents reported overwhelmingly (68.7%) that their respective programs had a considerably positive effect on improving machinery uptime, and 50.9 percent indicated that the programs also had a considerably positive effect on reducing machinery maintenance costs. As a result, technical information and procedural guidance from the manufacturers, when provided in a constructive, cooperative manner usually give the manufacturer a "leg up" in securing and retaining end-users' parts and service business. **The preventative maintenance concept therefore, offers exceptional opportunities for machinery manufacturers to make inroads with existing customers by providing valuable guidance in maintenance procedures.**

TABLE S-9

STEPS TAKEN BY THE SAMPLE'S COMPANIES TO REDUCE COSTS
RELATING TO PACKAGING MACHINERY PARTS
(By Percent of Those Required by Management to Reduce Costs)

<u>Steps Taken</u>	<u>Percent of Respondents (%)</u>
Having Parts Made by Local Machine Shops	54.9
Instituted or Upgraded Preventative Maintenance Program	48.6
Have Instituted a Better Inventory Control System	47.9
Relying More on Machinery Manufacturers' Parts Inventories	39.4
Relying More on Non-OEM Parts Replicators' Inventories	31.7
Going Out to More Parts Suppliers for Quotes	30.3
Relying More on General and Specialty Supply Houses' Inventories	24.6
Relying More on Machinery Distributors' Parts Inventories	23.9
Sharing Parts Inventories with Other Facilities	24.6

NOTE: Percentages exceed 100.0% because respondents gave multiple answers

Source: PMMI

How Customers Rate Packaging Machinery Manufacturers' Services

As a means of gauging customers' degrees of satisfaction and/or dissatisfaction with the machinery industry's services, the sample's respondents were asked to evaluate how they believe packaging machinery manufacturers perform according to various factors dealing with parts and service. Their evaluation was to be measured on a rating scale of 1 to 10, where 10 represents excellent and 1 represents terrible. In addition, respondents were asked to apply their ratings separately to North American packaging machinery manufacturers and Non-North American packaging machinery manufacturers and wherever possible, to provide supporting comments about their ratings. While the resulting data presented in Table S-10 vary by each factor, two obvious conclusions may nevertheless be drawn:

- (1) North American packaging machinery manufacturers are viewed more favorably than Non-North American manufacturers in regard to all of the factors.
- (2) Many customers see the need for significant improvement in the services provided by both.

Further insight into the rating scores and how the averages evolved can be obtained through an analysis of the second and third columns of the table, which list respectively, the percent of respondents rating the manufacturers a high score of 8, 9, or 10 and the percent rating them a low score of 1, 2, or 3. As shown, a considerably larger percent of respondents consistently rated the North American manufacturers 8 to 10 compared with the Non-North American manufacturers. Moreover, a larger proportion rated the Non-North American manufacturers 1 to 3 than they did the North American manufacturers. In-depth analyses of the rating scores together with supporting comments are provided in the Detailed Findings.

More Parts Business Potentially Available to Machinery Manufacturers

In light of the fact that North American packaging machinery manufacturers are currently losing 40 percent of their prospective parts business to other sources of supply (a basic finding of this research), it was deemed appropriate to examine if and how manufacturers could conceivably capture that business. Therefore, taking into account customers' priorities, their reasons for buying parts from alternative suppliers, as well their assessments of the services currently provided by the manufacturers, the study addressed the issue in terms of specific changes and improvements that could potentially offer positive results.

TABLE S-10
THE SAMPLE'S ASSESSMENTS OF NORTH AMERICAN AND NON-NORTH
AMERICAN PACKAGING MACHINERY MANUFACTURERS' PERFORMANCE
REGARDING PARTS AND REPAIR SERVICES
(Based on a Rating Scale of 1 – 10)

Terrible	Fair	OK	Good	Excellent
1.....	2.....	3.....	4.....	5.....
6.....	7.....	8.....	9.....	10

Factor	Average Rating		Percent Rated 8-10		Percent Rated 1-3	
	North American (1 to 10)	Non-North American (1 to 10)	North American (%)	Non-North American (%)	North American (%)	Non-North American (%)
Having Parts Available When Needed	7.4	5.4	59.8	21.6	1.4	24.2
Timely, Courteous Response to Inquiries	7.5	6.0	58.6	33.6	1.4	16.4
Consistency of Parts Quality	7.7	7.4	65.0	64.6	0.7	4.9
Order-Status Follow-Up	6.4	5.3	33.6	18.5	9.3	20.3
Meeting Delivery Commitments	7.0	5.8	50.5	26.0	2.9	15.0
Service on Obsolete Parts	5.7	4.5	19.0	10.3	11.2	36.0
Ease of Doing Business With Supplier	7.6	5.6	61.1	28.2	2.1	22.0
Reasonable Pricing on Parts	5.7	4.5	21.4	9.7	17.5	35.0
Technical Assistance	7.4	6.0	54.6	32.2	1.8	16.3
Repair/Rebuilding Services	6.7	5.2	40.6	18.3	4.2	22.6
Sales Representative Coverage and Assistance	6.7	5.3	41.3	21.7	8.1	24.4
Documentation	6.9	6.0	42.7	30.9	10.6	17.5

Source: PMMI

Overview – Basic Improvements Needed in Customer Service

Throughout much of the research, respondents' comments revealed an underlying common thread pointing to the need for an improvement in the caliber of customer service currently provided by the machinery manufacturers. While the attitude was not universally held among the sample's respondents – for some were vocally pleased with the services they receive from the manufacturers – the number identifying flaws was nevertheless significant. Many cited numerous instances of **inattentive parts service**, contrasted with the kind of attention manufacturers devote to landing new machine orders. Several alluded to the **slow response** they receive to requests for parts quotations, technical information, order confirmations, and updates on parts order status. And as obvious as it may appear, they claim too few people on the order desk offer a **simple thank you** for the business they receive. Many of the nuances associated with superior customer service obviously involve common sense, but for the most part, they are based on the idea of projecting a genuine attitude of efficiency, professionalism, appreciation of the customer's business, and a willingness to do whatever is necessary to ensure the customer's satisfaction – both at the time the machine order is placed and especially afterward. To a large extent, it requires **a proactive parts and service marketing effort emphasizing OEM quality and consistency** – and especially reflecting the machinery manufacturer's interest in serving its aftermarket customers effectively.

Specific Options

As the central methodology for examining options that could potentially provide machinery manufacturers with increased parts and service business, respondents were asked the question: *“Please indicate if any of the following steps (of improvement or innovation) would encourage you to increase the amount of parts you order from the machinery manufacturers (OEMS) rather than from other suppliers”*. And as shown in Table S-11, they were given the choices of: “NO EFFECT”; “MAY have a positive effect”; “WOULD LIKELY have a positive effect”; and “WOULD DEFINITELY have a positive effect”. The results, listed in the table, indicate the percent of the total sample answering for each of the four possibilities. Following that question, respondents were then asked: *“Ideally, how much of the parts business you currently give to other suppliers would you possibly give to the original packaging machinery manufacturers if they were to implement the improvements you indicated?”* Based on the results, manufacturers theoretically have the potential to

capture an average of 58.7 percent of the parts business they are currently losing to other suppliers. While the number is admittedly based on hypothetical conditions, it nevertheless confirms that end-users are open to the idea of working more closely with

TABLE S-11
POTENTIAL POSITIVE EFFECTS THAT SPECIFIC IMPROVEMENTS OR
INNOVATIONS IN SERVICES WOULD HAVE ON INCREASING THE AMOUNT
OF PARTS BUSINESS THAT END-USERS GIVE TO
THE MACHINERY MANUFACTURERS
(Percent of Sample's Respondents)

Proposed Improvement or Innovation in Service	<u>Would Have No Effect</u> (%)	<u>May Have a Positive Effect</u> (%)	<u>Would Likely Have a Positive Effect</u> (%)	<u>Would Definitely Have a Positive Effect</u> (%)
Provide Closer Tech Rep Contact	19.3	33.6	31.6	15.5
Speed Up Parts Deliveries, Shorter Lead Times	9.3	20.4	36.0	34.3
Offer Price Incentives on Orders for Common Parts	4.8	13.6	29.6	52.0
Offer price Incentives for Bundled Parts Packages	15.8	22.7	30.5	31.0
Provide Guarantee of Competitive Pricing	4.8	12.6	32.6	50.0
Provide More Technical Information	17.7	23.3	33.4	23.6
Offer Training on Maintenance Procedures	16.0	26.7	31.0	26.3
Offer Beneficial Parts Contract	25.3	34.9	27.6	12.2
Offer Inventory Consignment	34.8	29.4	18.3	17.5
Provide 24 Hour 'Round the Clock Service	13.7	24.4	26.7	35.2
Provide Better Documentation	21.9	24.9	29.8	23.4
Provide Direct Sales Rather Than Through Distributors	22.7	25.5	26.5	25.3
Provide Parts Reorder Reminders	38.9	34.4	16.0	10.7
Offer Periodic Parts Consultations	26.5	38.2	25.2	10.1
Offer Advantageous Maintenance/Repair Agreement	29.3	34.7	24.7	11.3

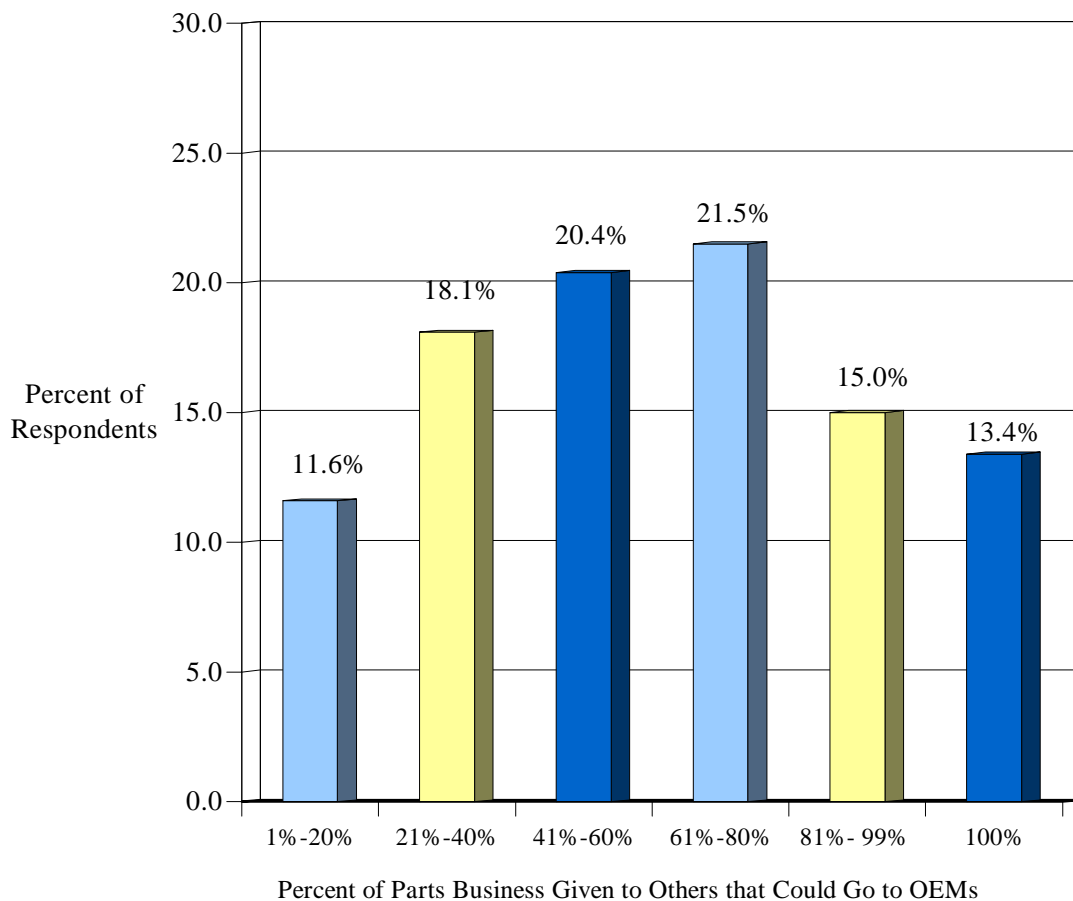
Source: PMMI

manufacturers on parts. It is important to note that each of the proposed improvements in Table S-11 is discussed extensively in the report's Detailed Findings along with numerous supporting comments from respondents. Figure S-6 graphically lists respondents' estimates of parts business currently given to alternative suppliers that they would consider giving to the manufacturers if the OEMs were to implement the improvements listed.

FIGURE S-6

**PERCENT OF PARTS BUSINESS CURRENTLY GIVEN TO
OTHER SUPPLIERS THAT MACHINERY MANUFACTURERS
COULD THEORETICALLY GAIN BY IMPLEMENTING
IMPROVEMENTS IN TABLE S-11**

(Percent of Sample's Respondents)



Source: PMMI

SECTION II

INTRODUCTION

Scope and Objectives

This report contains the findings of the 2004 PMMI Packaging Machinery Parts and Service Study conducted exclusively for PMMI by Industrial Research Associates, LLC. The principal objective of the study is to explore the issue of packaging machinery parts and aftermarket services from the perspective of the machinery end-user within the U.S. The project is thus designed to examine end-users' current procurement practices, trends in procurement, service preferences, and degrees of satisfaction with the aftermarket parts policies and services of both machinery manufacturers and alternative parts and service suppliers. The study's findings are intended to provide PMMI members with concrete, usable information about how end-users view the aftermarket and to explore opportunities for members to strengthen their respective parts and service businesses.

Methodology

In fulfilling the study's objectives, a questionnaire was designed for both personal telephone interviews and for completion by respondents via direct mail. Initially, 3,400 questionnaires were mailed in October and a follow-up mailing was sent in mid-November. A total of 243 completed questionnaires were returned by mail for a response rate of 7.1 percent. The return rate was comparatively lower than other similar mail surveys largely due to the questionnaire's complexity, detail and length. Industrial Research Associates conducted 217 personal telephone interviews which, added to the mail questionnaires, produced a total sample of 460 respondents. As an incentive to participate, all respondents were promised a copy of the final report and were told that their names would be included in a drawing for one of ten \$150 American Express Gift Cards. They were also promised that their responses would remain totally confidential and would be included only as part of grouped data. The 460 respondents – essentially decision makers for selection and/or ordering of parts and service for packaging machinery – were responsible collectively for 1,191 plants and 17,934 packaging machines located throughout the U.S. The telephone interviews, which followed a structured format, but were designed to facilitate open-ended questioning and probing, often lasted as long as 30 minutes. The interviews were conducted from November 2004 through December 2004.

Derivation of Parts and Service Dollar-Volume Estimates

The dollar-volume estimates of U.S. domestic expenditures for packaging machinery parts and service were derived from the following calculations:

The U.S. 2002 Census of Manufactures for packaging machinery shows that U.S. manufacturers' shipments of parts represented 17.9 percent of the industry's total billings of new-units and parts combined in 2002 (the most recent year of such data). The 17.9 (roughly 18) percent figure coincides with estimates provided informally in recent years by various members of PMMI. This PMMI research found that machinery manufacturers garnered approximately 59-61 percent of the domestic market's total spending for packaging machinery parts in 2004 (and alternative suppliers captured the remaining 39-41 percent.) Therefore, assuming that parts continued to represent 18 percent of total industry billings in 2004 as well, the following calculation allowed for projection of the domestic market's dollar spending for packaging machinery parts in 2004. Dividing .18 (parts as percent of manufacturers' total billings) by .61 (machinery manufacturers' high-side share of total domestic parts expenditures) produces a .30 value representing parts as a percent of total spending for the combined aggregate of parts, service, and new machines. The same holds true for the $(.18 \div .59 = .31)$ calculation of the 59-61 percent range. The 30-31 percent range, therefore, represents parts expenditures as a percent of total domestic spending for machines, parts, and service combined. The most recent PMMI Purchasing Plans Study estimated U.S. domestic demand for packaging machines at \$5.5 billion. Also, a survey of packaging machinery manufacturers produced an estimate of total service spending at 4-5 percent of the new units-parts-service aggregate. Therefore, of total domestic spending associated with packaging machinery:

New Units = 63% to 66%

Parts = 30% to 31%

Service = 4% to 5%

By factoring in new unit expenditures (domestic machinery demand) at \$5.5 billion, representing both 66 percent and 63 percent of total spending ($100\% - 30\% + 4\% = 66\%$ and $100\% - 31\% + 5\% = 63\%$), the dollar-volume ranges resulted and were rounded.

Details of the Sample's Composition and Related Pertinent Data

Tables I-1 through I-7 present breakdowns of the sample by seven criteria: (I-1) by market segment, (I-2) by number of packaging machines in operation, (I-3) by range of 2004 expenditures for packaging machinery parts, (I-3A) Spending for parts by dollar volume range by number of machines in operation (I-4) by respondent job title, (I-5) by category of machinery in operation, (I-6) by average age of packaging machinery in operation, and (I-7) by origin of packaging machinery in operation – North American and Non-North American. Following the tables is a complete listing of the actual companies included in the sample. In keeping with the promise of anonymity given to each of the respondents, names, titles, and facility locations are omitted.

TABLE I-1
THE SAMPLE BY MARKET SEGMENT

(Percent of Total Respondents)

<u>Market Segment</u> (Listed Alphabetically)	<u>Number of Respondents</u> (#)	<u>Percent of Total Sample</u> (%)
Beverages	46	10.0
Consumer and Commercial Durable Products, including Hardware, Plumbing, Automotive, Industrial and Related Components and Parts	36	7.8
Food & Food Preparations	200	43.5
Household and Industrial Chemicals and Cleaning/Finishing Products	50	10.9
Paper Products, Textiles, and All Other Soft- and Hard-Good Non-Durables, n.e.c.	29	6.3
Personal Care Products (Cosmetics, Toiletries and All Other Related Items)	23	5.0
Pharmaceuticals and Medical Devices	60	13.0
Printers, Publishers, and Packaging Converters, Other	16	3.5
TOTAL	460	100.0

TABLE I-2

THE SAMPLE BY NUMBER OF PACKAGING MACHINES IN OPERATION

<u>Range</u>	<u>Number of Respondents</u> (#)	<u>Percent of Total Sample</u> (%)
1 – 6	107	23.3
7 – 12	83	18.0
13 – 21	71	15.4
22 – 33	71	15.4
Over 33	12 8	27.8
TOTAL	460	99.9*

Less than 100.0% due to rounding

TABLE I-3

**THE SAMPLE'S 2004 SPENDING FOR PACKAGING MACHINERY
PARTS BY DOLLAR-VOLUME RANGE**

<u>2004 Packaging Machinery Parts Purchases</u> (\$)	<u>Number of Respondents</u> (#)	<u>Percent of Total Sample</u> (%)
Less than \$25,000	94	21.1
\$25,000 to \$50,000	48	10.8
\$50,001 to \$100,000	56	12.6
\$100,001 to \$200,000	63	14.2
\$200,001 to \$300,000	49	11.0
\$300,001 to \$400,000	23	5.2
\$400,001 to \$500,000	31	7.0
Over \$500,000	81	18.2
TOTAL	445*	100.1**

* 15 respondents did not provide a value for their 2004 packaging machinery parts purchases

** Exceeds 100.0 percent due to rounding

TABLE I-3A

**THE SAMPLE'S 2004 SPENDING FOR PACKAGING MACHINERY PARTS BY
DOLLAR VOLUME RANGE BY NUMBER OF MACHINES IN OPERATION**

Expenditures	1-6 Machines (%)	7-12 Machines (%)	13-21 Machines (%)	22-33 Machines (%)	Over 33 Machines (%)
Less than \$25,000	54.4	28.9	16.9	7.0	2.3
\$25,000-\$50,000	12.2	15.7	14.1	12.7	3.9
\$50,001-\$100,000	11.1	19.3	15.5	16.9	5.5
\$100,001-\$200,000	13.3	7.2	18.3	18.3	14.8
\$200,001-\$300,000	2.2	10.8	12.7	15.5	13.3
\$300,001-\$400,000	1.1	2.4	9.9	5.6	7.0
\$400,001-\$500,000	2.2	4.8	7.0	8.5	10.9
Over \$500,000	3.3	10.8	5.6	15.5	42.2
TOTAL	99.8*	99.9*	100.0	100.0	99.9*
Average Spending	\$119,122	\$235,970	\$262,648	\$440,000	\$1,191,422

*Differs from 100.0% due to rounding

Average spending by sample = \$500,569

TABLE I-4

THE SAMPLE BY RESPONDENT JOB TITLE

<u>Title or Job Function</u>	<u>Number of Respondents (#)</u>	<u>Percent of Total (%)</u>
Owner, President, General Manager	12	2.6
Packaging Manager, VP, Director	10	2.2
Operations Manager, VP, Director	18	3.9
Engineering, Mfg. Manager, VP, Director	43	9.3
Production Manager	26	5.7
Plant Manager, Superintendent	61	13.3
Purchasing Manager	19	4.1
Maintenance Manager, Supt, Forman	150	32.6
Maintenance Engineer	14	3.0
Plant Engineer	62	13.5
Packaging, Mfg. and Other Engineers	27	5.9
Other	18	3.9
TOTAL	460	100.0

TABLE I-5**THE SAMPLE BY CATEGORY OF MACHINERY IN OPERATION**

Category of Machinery	Percent With Category of Machinery in Operation (%)
Bagging (Pre-made Bags)	50.0
Capping	39.4
Cartoning	52.2
Casing	51.2
Coding	72.1
Conveying, Feeding, Orienting, Placing	76.8
Filling – Dry Products	40.7
Filling – Liquid Products	44.1
Vertical Form/Fill/Seal (Pouch)	34.0
Horizontal Form/Fill/Seal (Pouch)	25.6
Inspecting, Detecting	53.2
Labeling	71.4
Palletizing, Unitizing	49.2
Shrink Film Heating, Heat Sealing	50.5
Skin or Blister	16.8
Wrapping	62.3

TABLE I-6**THE SAMPLE BY AVERAGE AGE OF PACKAGING MACHINERY IN OPERATION**

Average Age of Machinery	Percent of Sample (%)
Less Than 2 Years	1.2
2 – 4 Years	7.8
5 – 7 Years	29.1
8 – 10 Years	27.9
11 – 13 Years	11.5
14 – 16 Years	11.9
17 – 19 Years	4.9
20 Years and More	5.7
TOTAL	100.0

TABLE I-7

NUMBER OF NORTH AMERICAN PACKAGING MACHINES AND NON-NORTH AMERICAN PACKAGING MACHINES OPERATING IN THE SAMPLE'S PLANTS

Origin of Manufacture	Number of Machines*
North America	14,181
Outside North America	3,753
TOTAL	17,934*

*Based on mid-point averaging of range designations

THE COMPANIES STUDIED

Abbott Labs (3)	ASO Corp.
Access Business Group (2)	Aspen Products, Inc.
Accu-Tec, Inc.	Associated Milk Producers, Inc.
Acme Cake Co.	Astra Zeneca
Acuity Specialty Products	Avon Products
Acushnet Company	Azteca Milling, L.P.
Adams Labs, Inc.	B & G Foods
Adirondack Beverages	Bacardi Bottling Corporation
ADM Cocoa	Barcelona Nut Co.
Admiral Beverage Co.	Bar-S Foods Co.
Advance Brands	Basic American Food
Advanced H2O	Bausch Lomb
Agrilink Foods	Baxter Healthcare
Akron Coating & Adhesive	Bayer Healthcare, LLC
Alcoa Consumer Products	Bemis Mfg. Co.
Alcon Mfg.	Berkshire Corporation
Alkco Lighting	Berry Plastics
Alliance Rock	Bethlehem Industries, Inc.
Alpenrose Dairy	Big Train, Inc.
Alpine Health Products	Birch Wood Laboratories, Inc.
Amalgamated Sugar	Bluegrass Quality Meats
American Almond Products	Boehringer-Ingelheim
American Instants, Inc.	Bond Corp.
American Millwork Corporation	Botanical Labs, Inc.
American Nutrition	Bristol-Myers Squibb Co.
American Sugar Refining Inc.	Brown Forman
Ampad	Buffalo Rock Company
Andes Candies, L.P.	Buffalo Trace Distillery
Anvil International	Burger's Ozark Country Cured Hams, Inc.
ARC Diversified	Burrows Paper Co.
Arrowhead Mills, Inc.	Burt's Bees
	Butterfield Foods
	C.B. Fleet Company, Inc.
	Calwis Co., Inc.

Canandaigua Wine Co.
 Capital Plastic Products
 Caraustar
 Cardinal Health
 Carlee Corp.
 Carriage House
 Carrollton Specialty Products
 Cascades Tissue
 CCDA Waters
 Cedar Crest Specialties
 Cello-Foil Products, Inc.
 Chanel, Inc.
 Chef Solutions (2)
 Chicago Rawhide
 China Mist Tea
 Church & Dwight Co., Inc. (2)
 Cibo Naturals (2)
 Circle S Foods
 Classic Snacks, Inc.
 Clavel Corporation
 Clean Control
 Clinical Reference Lab
 Clorox
 CM Products
 Coca Cola Enterprises
 Colgate Oral Pharmaceuticals
 Combe Laboratories, Inc.
 Complete Packaging
 Con Agra Foods (6)
 Conair
 Concord Foods
 Consolidated Biscuit Company
 Cookiecreeper Bakeries
 Coors Brewing Company
 Copps Industries, Inc.
 Corfu Foods, Inc.
 Costco Wholesale
 Country Pure Foods, Inc.
 Crain Walnut Shelling
 Crystal Farms
 CSB Nutrition Grove, Inc.
 Culinary Arts Specialties, Inc.
 Cumberland Gap Prov. Co.
 Custom Building Products
 D.B. Yuengling & Son
 D.F. Stauffer Biscuit
 D.F.S.
 Dairy Farmers of America, Inc.
 Danisco USA, Inc. (2)
 Del Monte Foods (4)

Delicato Vineyards
 Delta Petroleum
 Den-Mat, Inc.
 Dentsply International
 Deseret Meat Co.
 Deseret Pasta
 Dial Corporation (2)
 Doane Pet Care
 Dr. Pepper/7Up Bottling Group
 Echosphere
 Ecolab, Inc. (2)
 Ellison Bakery, Inc.
 Emco Chemical Distributors
 EMD Chemicals, Inc.
 Emmepak Foods
 Engelhard Corporation
 Epic Enterprises
 Eppendorf 5 Prime
 Ervin Industries
 Everett Mfg.
 Everfresh Food Corp.
 Excelda Manufacturing
 Fairmount Foods
 Farbest Foods, Inc.
 Farmdale Creamery
 Fellowes, Inc.
 Field Packing Co. (2)
 Fishing Processors, Inc.
 Flavorchem
 Flexsol Packaging
 Foran Spice Co., Inc.
 Forest Laboratories
 Franklin Connections
 Freirich Foods Inc
 Fremont Beef Co.
 Fresenius Medical Care
 Frito Lay
 Fujisawa Healthcare, Inc.
 Garden Row Foods
 Gelita USA
 General Chemical LLC
 Genesis Pharmaceutical
 Genie Company
 Gent-L-Kleen Products, Inc.
 Gertrude Hawk Chocolates
 Glaxo Smith Kline
 Golden Grain
 Gould Packaging
 Grain Processing Corp.
 Griffith Laboratories

Guardian Drug Company
 Hall Hodges Company, Inc.
 Harlan Sprague Dawley, Inc.
 Harrington Bottling
 Hartz Mountain, Inc.
 Hawaiiin Sun Products
 Heinz North America
 Helluva Good, LLC
 Henry Molded Pulp, Inc.
 Heraeus Kulzer
 Hershey Creamery Co.
 Hershey Foods Corp. (2)
 Hershey's Chocolate of Virginia
 Highland Manor Winery
 Hill View Packing Co., Inc.
 Hinckley Springs
 Hinsdale Farms
 HMT Manufacturing, Inc.
 Home Diagnostics, Inc.
 Hoover Precision Products
 Horizon Milling, LLC
 Houston Harvest Gift Products
 HRH Technologies
 Hubbard Peanut Company, Inc.
 Hyde & Hyde, Inc.
 Hypoguard
 Illinois Correctional Industries
 Illumina, Inc.
 Interbake Foods LLC
 International Paper
 Interstate Brands Corporation
 Isotec
 J.R. Peters, Inc.
 J.R. Simplot Company
 Jasper Wyman & Son
 JC Solution, Inc. (2)
 Jennie-O Turkey Store Co.
 Jessup Mfg.
 Jim Beam Brands (2)
 Joe Corbi's Pizza Kits
 Johnson & Johnson (2)
 Jon Donaire Desserts
 Kalil Bottling Co.
 Kelley Technical Coatings
 Kellogg Co. (2)
 Kencraft, Inc.
 Kenney Mfg.
 Kenny's Candy Co.
 Kerry Sweet Ingredients (2)
 Kerry, Inc.

Keystone Cement
 Kiapak, Inc.
 Kimberly-Clark Corp.
 King Pharmaceuticals, Inc. (2)
 Kingsford Mfg.
 KinPak, Inc.
 Klement Sausage Company
 Knouse Foods Co-op
 Kraft Foods
 Kroger Layton Manufacturing
 Kurz Transfer Products, LLC
 KV Pharmaceutical Co.
 Land O' Lakes Purina Feeds, LLC (3)
 Land O' Lakes, Inc. (2)
 Lander Co., Inc.
 Landis Plastics, Inc.
 Lawson Products, Inc.
 Lenders Bagels
 Lily of the Desert
 Link Snacks, Inc.
 Logan International
 Louisiana Pigment Company (2)
 Lund Food Holdings
 Magietta Corp.
 Mapei Corporation
 Marietta Corp.
 Marigold Foods, LLC
 Marzetti Frozen Pasta (3)
 McCain Foods USA
 McCleary Industries
 McCormick & Co. (2)
 McCormick Distilling Co.
 McKesson/RXPAK
 Mead Johnson Nutritionals
 Mead Westvaco
 Meadow Gold Dairies
 Medline Industries
 Merck & Company
 MI Window and Doors
 Michigan City Baking (2)
 Micropack Bottled Water
 Midwest Fasteners
 Milk Specialties
 Momence Packing
 Mosaic Phosphates
 Mountain Brook Water
 Mountain Country Foods
 Multifoods Food Service
 Mylan Labs
 National Guard Products

National Starch & Chemical
 Natures Way Products
 NCP Enterprises
 Nestle
 Nestle Purina Pet Care
 Nestle-HAFG
 New Pig Corp.
 Neways International
 Newly Weds Foods, Inc.
 Nintendo of America
 Northern Falls Water
 Nova Chemicals
 Novartis Consumer Health (3)
 Oak State Products
 Ocean Spray Cranberries, Inc.
 OSI Foods
 Ovasco
 Overhead Door
 PAC National
 Packaging Advantage
 Packaging Corporation of America
 Paige Meadows
 Pak Technologies (2)
 Palmer Paint Products
 Pandora Manufacturing, LLC
 PBM Packaging
 Pepperidge Farm
 Pepsi Bottling Ventures
 Perfection Bakeries
 Permatex, Inc.
 Perrigo Company
 PF Labs (2)
 Pfizer, Inc. (4)
 Pierre Foods
 Pinnacle Foods/Lenders Bagels
 Pioneer Hi-Bred International
 Pittsburgh Brewing Co.
 Plastipak
 Playtex Products
 Poore Brothers
 Prairie Packaging
 Premier Blending Hilton House
 Premier Foods, Inc.
 Prime Enterprises
 Priority Food Processing
 Progressive Laboratories
 Progressive Plastics, Inc.
 Quality Naturally Foods
 R.L. Schreiber
 Ralston Foods

Rayovac
 Reckitt Benckiser
 Request Foods, Inc.
 Rex Corp.
 Rhodes International (2)
 Rice Tec
 Rich Products
 Rochester Cheese
 Rock-Tenn Company-Kerman Folding
 Royal Crown Bottling Co.
 RPG Manufacturing
 Rudolph Foods
 Rumiano Cheese
 Russell Stover Candies
 Rust-Oleum Corp., Inc.
 Saco Foods, Inc. (2)
 Safeway Bakery
 Sage Products
 Salad Cosmo USA
 Saputo USA
 Sartomer Company, Inc.
 SCA Tissue
 Schering Plough
 Schwarz Pharma
 Schwarzkopf Technologies
 Sconza Candy Co.
 Sem Products
 Seneca Foods (2)
 Servaas Labs
 SFF
 Sherwin Williams Co. (2)
 Shirlo, Inc.
 Silver Star Meats, Inc.
 Smith Provision Co., Inc.
 Smucker Quality Beverages
 Snack Corp.
 Snyder-Birds Eye Foods
 Snyders Bakery
 Solo Cup Company
 Southern Bottled Water
 SSDC Ecolab
 Stanislaus Food Products
 Starkey Chemical (2)
 State Industrial Products
 Steris Laboratories
 Stolt Sea Farm
 Stonyfield Farm
 STS Foods
 Sunland, Inc.
 Sunseeds

Sunshine Fresh, Inc.
Suntree LLC
Superb Packaging, Inc.
Supherb Farms (2)
Supreme Meats, Inc.
Sutter Home Winery
Swan Packing
Swanson Wiper Corp.
Temkin International, Inc.
Tender Corporation
Tennessee Quality Foods
Terradyne Naturale, Inc.
Textron Fastening Systems
The Amalgamated Sugar Co.
The Flood Company
The Mentholatum Co., Inc.
Tone Products
Tops Business Forms
Total Logistic Control
Tradenet Publishing
True Value Mfg.
TS Tech USA Corp.
Tyco Plastics
Tyson Foods
U.C. Milk Company, LLC
U.S. Chemical
Unicep Packaging
Unilever (2)
United States Distilled Products
United Sugars Corp.
Vanderbilt Chemical Corp.
Ventura Foods
Vermont American Tools
Vermont Medical
Vie De France
Web Converting, Inc.
Weyerhaeuser Co.
White Coffee
White Rock Distilleries
Whitfield Foods, Inc.
Windy Acres
WM Wrigley Jr. Co.
Wyeth Nutritionals
Wyeth Pharmaceuticals

SECTION III

DETAILED FINDINGS

Significance of the Parts and Service Markets

Estimates derived from a combination of secondary data projections and independent research place the value-share of U.S. packaging machinery *parts* expenditures at approximately 30-31 percent³ of all domestic spending associated with packaging machinery. Given that U.S. domestic demand for packaging *machines* amounted to a projected \$5.5 billion⁴ in 2004, *parts expenditures* would have therefore amounted to approximately \$2.5-\$2.7 billion for the year (please see derivation in Section II.) It must be pointed out, however, that machinery-related *service expenditures* are less readily definable without more focused study, especially inasmuch as a significant portion of the service performed by OEMs is included as contractual work in new machinery billings. Nevertheless, in the interest of providing a general indication of its relative size, an estimate was developed largely on data derived from a limited survey of machinery manufacturers. Based on those results, service is believed to represent roughly 4-5 percent of total machinery-related expenditures when taking into account routine repairs, retrofits, overhauls and maintenance, emergency repairs, etc., which projects *service expenditures* to approximately \$333-430 million in 2004. But of greater significance, the parts and service operations of most packaging machinery manufacturers are responsible for disproportionately high share of the machinery industry's annual profits, a factor suggesting – if not beseeching – that manufacturers pay greater attention to the aftermarket.

Where the Parts Dollars are Going – an Overview

As Figure 1 illustrates, packaging machinery manufacturers (OEMs) as a group captured 41.3 percent of the total dollar value of the 2004 packaging machinery direct parts sales for their own respective machinery brands in the U.S. The figure also shows that sales by manufacturers' authorized distributors were responsible for 13.5 percent; however, it is probable that about a quarter of the distributors' share involved some combination of common/commercial parts and/or non-OEM parts whose values did not accrue back to the

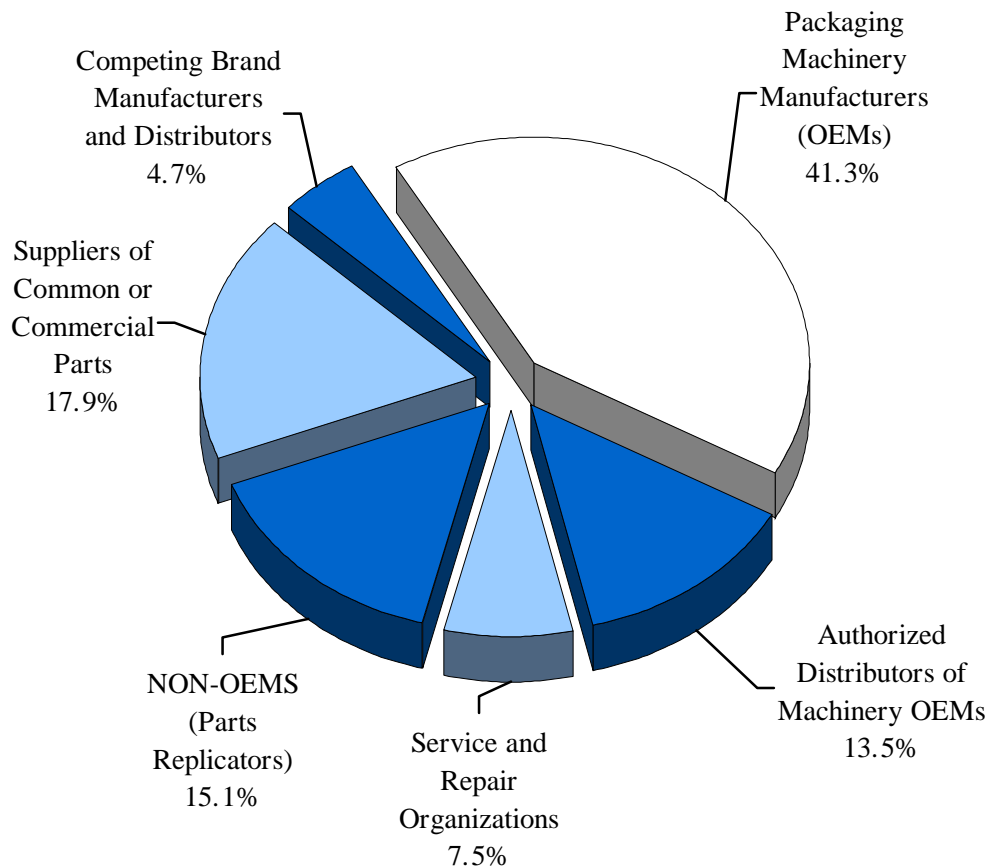
³ Please see Introduction for derivation of 30-32 percent representation as well as for detailed sample data.

⁴ PMMI Purchasing Plans Report and Shipments and Outlook Report

OEMs. By the same token, OEMs *did* benefit from sales of parts installed in conjunction with service work. But while the pie chart shows that service work generated 7.5 percent of the total domestic parts dollar volume, it was found that service organizations of the OEMs and their distributors performed and billed an estimated 68.7 percent of the service work conducted on packaging machines in the U.S. (please see discussion of service work later on). Non-OEM suppliers selling replicated parts accounted for 15.1 percent, and suppliers

FIGURE 1

**U.S. 2004 DOMESTIC SALES OF PACKAGING MACHINERY
PARTS BY PRINCIPAL TYPE OF SUPPLIER
(Percent of Total Dollar Value)**



Source: PMMI

of common or commercial (outsourced parts), such as controls, cylinders, motors, starters, etc., generated 17.9 percent. As the figure indicates, the remaining share (4.7 percent) was held by a combination of OEMs and distributors who sell parts for competing machines e.g., a manufacturer of one brand of wrapper selling parts for a competing brand of wrapper. In these cases, it is likely that the parts are either non-OEM (replicates) or are common-commercial parts.

As will be shown in the discussion that follows, however, the actual volume of non-OEM (replicated) parts plus common or commercial parts sold by others in the U.S. is relatively high. In fact, **U.S. packaging machinery manufacturers relinquished roughly 40 percent of their prospective parts business to other sources of supply in 2004.**

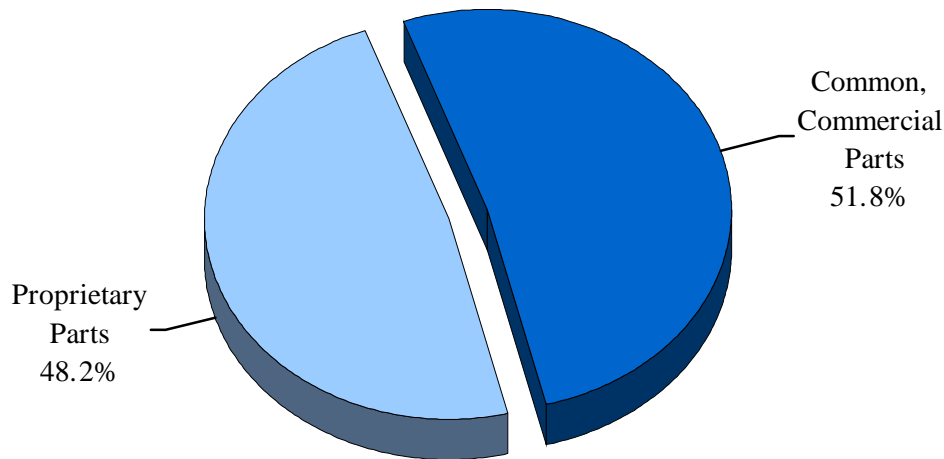
Proprietary Parts versus Common or Commercial Parts

Much of the reason behind the relatively wide dispersion of supplier market shares shown in Figure 1 is traceable to the inherently diverse nature of the parts sold for packaging machines. For purposes of this research, parts have been classified according to two basic categories: (1) proprietary parts and (2) common or commercial parts. Proprietary parts, which are exclusive to a particular brand and/or model of machine, such as *formers, augers, nozzles, funnels, hoppers, shafts, hubs, rings, baffles, feeders, star wheels, timing screws, connectors, etc.*, represent the heart of the machinery manufacturers' parts business and profit center. On the other hand, common or commercial parts, which are typically outsourced by the packaging machinery manufacturers from other suppliers and incorporated into their machines, are more widely available in the general marketplace and thus generally offer less of a profit potential for the packaging machinery manufacturers. These parts include, among others: *motors, controls, cylinders, valves, solenoids, brakes, clutches, PLCs, servos, circuit boards, computer components, couplings, gears, etc.*

According to the findings, common parts accounted for a slight majority of the aggregate packaging machinery parts dollar volume in 2004. As Figure 2 indicates, they represented 51.8 percent of the total for the year, and proprietary parts the 48.2 percent balance. But owing to the plethora of technological advances and design changes currently reshaping the

FIGURE 2

**U.S 2004 DOMESTIC MARKET EXPENDITURES FOR
PACKAGING MACHINERY PARTS BY PRINCIPAL
CATEGORY OF PART
(Percent of Total Dollar Value)**



Source: PMMI

packaging machinery environment, the ratio could fluctuate from one year to the next. With the increasing use of digital servo control, the market is undoubtedly moving toward more electronic motion and less mechanical action, thereby resulting in the reduced use of certain kinds of common or commercial parts, such as gearboxes, couplings, sprocket drives, bearings and supports, pillow blocks, and a variety of others. Inasmuch as electronic motion control parts tend to fail less frequently than mechanical motion parts, which are inherently subject to more wear, the volume of common parts replacement might appear to be on the wane. By the same token, however, the trend is also resulting in the use of fewer proprietary *primary motion* parts as well, such as shafts, cams and levers; however, the erosion is occurring at a slower pace than that for common parts. For irrespective of the trend, the use of such basic proprietary parts as formers, augers, nozzles, funnels, hoppers, shafts, hubs,

rings, baffles, feeders, star wheels, timing screws, and connectors, etc. will always be essential. It is most important to emphasize, however, that the effect of the trend – as to the common parts-proprietary parts ratio – varies by type of machine.

Customers' Attitudes, Priorities and Concerns

Pick any category of machinery and market served and invariably the two most widely cited issues of dissatisfaction will be: (1) parts prices are too high and (2) delivery is too slow. It goes without saying that the packaging machinery industry is no exception to the rule. As the following discussion will reveal, price and delivery *are* clearly paramount in the minds of decision makers charged with the responsibility of selecting suppliers and ordering parts for packaging machines in their respective plants. But the findings also revealed that several other factors – when linked in combination or even considered separately – exert as much if not more influence in the final analysis on how end-users order parts.

The Impact of Price

According to the data, approximately **61 percent** of the study's sample reported that they **consistently seek the lowest prices on all** the parts they order for their existing packaging machinery as their primary consideration; however, they also genuinely weigh other factors in their decision, such as delivery, quality, etc. (Figure 3). Another **31 percent** indicated that their lowest-price requirement is **limited to only common/commercial parts**, and that they order proprietary parts – usually irrespective of price – strictly from the machinery OEMS or their distributors. Of the balance, 7.7 percent claimed that price generally plays **a secondary role** to such other factors as parts quality, parts availability, and service, while 0.4 percent reported buying only on the basis of low price.

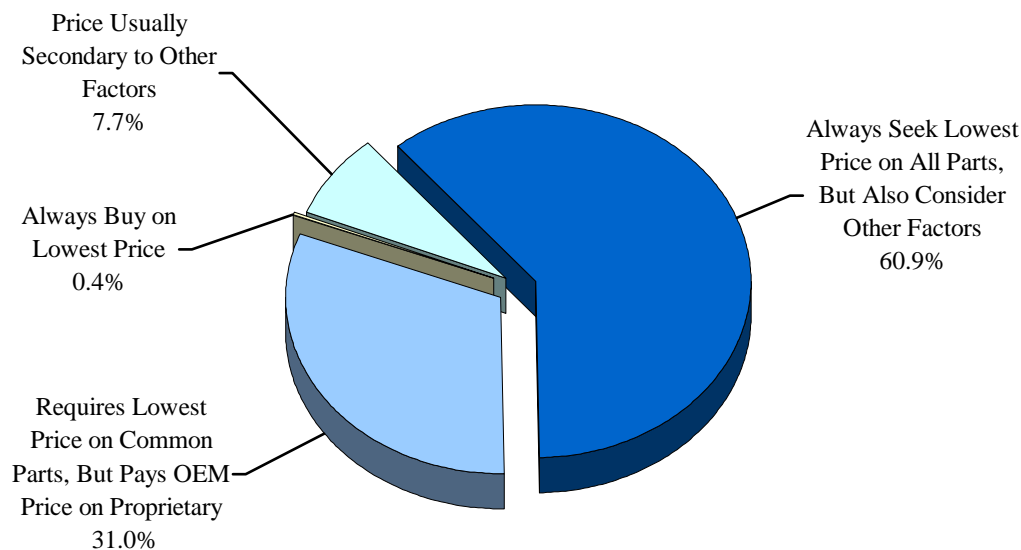
Aftermarket Business Lost to Alternative Parts Suppliers Offering Lower Prices

As will be discussed in more detail later on, a large proportion of the machinery industry's customers readily take advantage of lower parts prices offered by alternative suppliers – namely non-OEMS (parts replicators), manufacturers and distributors of common or commercial parts originally installed in the packaging machinery, and local machine shops. While lower price is not *always* the motivating factor causing end-users to look

elsewhere for other sources of supply, it clearly ranks among the highest. Its greatest impact is exerted in decisions involving common parts, which are available directly from the common parts or components manufacturer or from their local distributors. Though the packaging machinery manufacturers are commonly provided with an OEM or reseller discount, which theoretically prices the part below the standard end-user's cost, the differential in most cases is insufficient to allow the machinery manufacturers to sell the

FIGURE 3

THE IMPACT OF PRICE ON CUSTOMERS' PARTS-ORDERING DECISIONS
(Based on Sample's Response)



Source: PMMI

parts at market price and still realize a profit at or near the level of their proprietary parts business. Consequently, in reselling common parts, the machinery manufacturers mark up their prices to levels that some customers consider exorbitant. In fact, it has become common practice by many large end-users to require the machinery manufacturers to provide them with the original common parts manufacturer's part number to allow them to source their parts directly.

Parts supplied by non-OEMs (replicators), which largely targeting proprietary parts – those exclusive to a particular brand and model of machine – are also typically lower in

price than the machinery manufacturers' (genuine OEM) parts; however, as will be pointed out later in the discussion of non-OEMs, other factors also play a key role in advancing their market penetration.

Potential Influence of Parts Prices in New Machinery Decisions

The findings also revealed that the impact of parts pricing extends beyond the mere issue of aftermarket sales and into **decisions involving selection of new packaging machinery**. For over three-quarters of the sample's respondents indicated that when considering the purchase of a new packaging machine they request a quotation from the machinery manufacturer on spare parts for the machine in question before making the decision to purchase the new unit. Specifically, 21.1 percent reported that they *always* request a preliminary parts quote, and the majority – 55.3 percent – indicated that they *sometimes* request a preliminary spares quote before such a decision is made. Respondents making up the 23.6 percent balance stated that as a general practice they do not request such a quotation in conjunction with new machinery acquisition evaluations.

But of the 76.4 percent that elicit price quotes as part of the new machine analysis, nearly a third (31.4%) claimed that if the parts prices are judged to be too high, the decision makers could possibly cause rejection of the new packaging machine purchase on that basis. Conversely, 66.5 percent indicated that a favorable parts pricing analysis could be a decisive positive factor in ordering the new machine. Only 16.6 percent claimed that although they inquire about parts prices, the results usually have no impact on equipment decisions. (Please note that the percentages exceed 100.0 because respondents were permitted to indicate more than one possible answer to the question.)

Proactive Cost-of-Ownership Analysis a Plus

In further expanding on the issue of parts pricing as a factor in new machinery decisions, the following question was posed to the respondents: *“Do you think that a documented cost-of-ownership projection (including spares, maintenance, etc.) presented with the new machine quotation could make a positive difference in the selection decision?”*

Of the sample, 38.3 percent were lukewarm to the idea by indicating possibly; however, 41.6 percent said ‘very likely’ and 15.2 percent said ‘definitely.’ Only 4.9 percent thought that it would probably have no effect. It may therefore be concluded that an initiative by machinery manufacturers in proactively promoting the idea of economical cost-of-ownership for machinery under consideration *could conceivably* aid the manufacturer in advancing new unit sales.

The Impact of Parts Availability and Speed of Delivery

With an increasing number of end-users seeking to reduce the size of their replacement parts inventories in an effort to cut costs, there is generally a greater tendency for them to depend more heavily on parts suppliers’ inventories. Customers, therefore, want to count on their parts supplier to deliver parts when promised so that replacements can be made when scheduled. According to the findings, the largest number of respondents cited “*meeting delivery commitments*” as the leading delivery-related attribute sought in a supplier of packaging machinery. As Figure 4 indicates, the factor received an average rating of 7.3 out of 8.0; moreover, 84.1 percent of the respondents gave it either a 7 or 8 rating (Table 1). Not surprisingly, the factor of “*fast delivery of standard parts*” was also cited as a leading priority with a score of 7.1 out of 8.0 and an 76.6 percent share of respondents rating it 7 or 8.

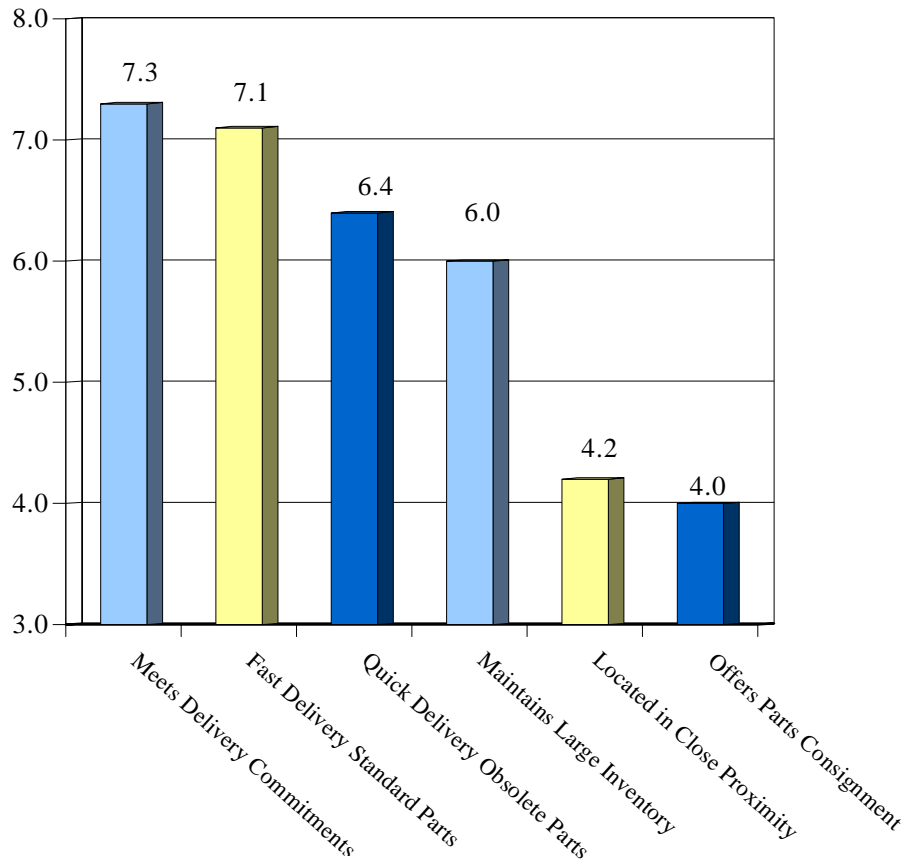
Availability of Standard (Current Parts) Vs. Obsolete Parts

It is important to note that in the question dealing with parts availability/delivery, a distinction was made between standard (current) parts and obsolete parts owing to the different characteristics of each. In fact, customers generally expect to see standard parts in stock in a supplier’s inventory, but recognize that obsolete parts may take longer to obtain. Their acknowledgement of a longer lead time on obsolete parts procurement is reflected in the 6.4 out of 8.0 rating it received and the fact that only 59.3 percent of the respondents rated “quick delivery of obsolete parts” a 7.0 or 8.0 priority.

FIGURE 4

**CUSTOMERS' PRIORITIES REGARDING PARTS
AVAILABILITY AND SPEED OF DELIVERY**

(Sample's Rating of Each Factor's Effect on Selection of a Parts Supplier
0= No Effect, 8= Major Effect)



Source: PMMI

When asked how fast they'd like to receive **standard parts**, **73.2 percent of the respondents indicated a time frame of "next day"**, while 19.6 percent would find 2-3 days "acceptable" and 7.2 percent over 3 days as "OK." The average acceptable time

overall was 1.7 days and the median one day. By contrast, the acceptable or preferred delivery time frame for obsolete parts was 7.3 days with a median of 7.0 days. The response was distributed as follows:

- 36.4 percent -- 1 week
- 22.7 percent -- next day
- 9.8 percent -- 2-3 days
- 31.1 percent – Over 1 week to three weeks

TABLE 1
CUSTOMERS' PRIORITIES REGARDING PARTS AVAILABILITY
AND SPEED OF DELIVERY
(Sample's Rating of Each Factor's Effect on Selection of a Parts Supplier
0= No Effect, 8= Major Effect)

Factor	Average Rating (Based on Scale of 0 to 8)	Percent Rating Factor 7 or 8 (%)
Meets Delivery Commitments	7.3	84.1
Fast Parts Delivery for Standard Parts	7.1	76.6
Quick Delivery of Obsolete Parts	6.4	59.3
Maintains Large Parts Inventory	6.0	47.7

Source: PMMI

As will be shown in later discussion, the issue of long deliveries by machinery OEMs on parts for obsolete packaging machinery has implications that extend beyond merely an acknowledgement of customers' dissatisfaction with current delivery times and their desire for improvement. For the findings also revealed that many of the customers that currently order non-OEM or replicated parts are doing so – not only to pay a lower price than the OEMs charge – but if not more importantly, to obtain the parts quicker. With packaging machinery technology advancing at lightning speed, obsolescence is becoming more common with machines that many would otherwise consider not particularly old. Therefore, as the new models replace older versions, the older parts are less readily available; consequently, the deficiency is causing an increasing number of customers to seek alternative sources of supply.

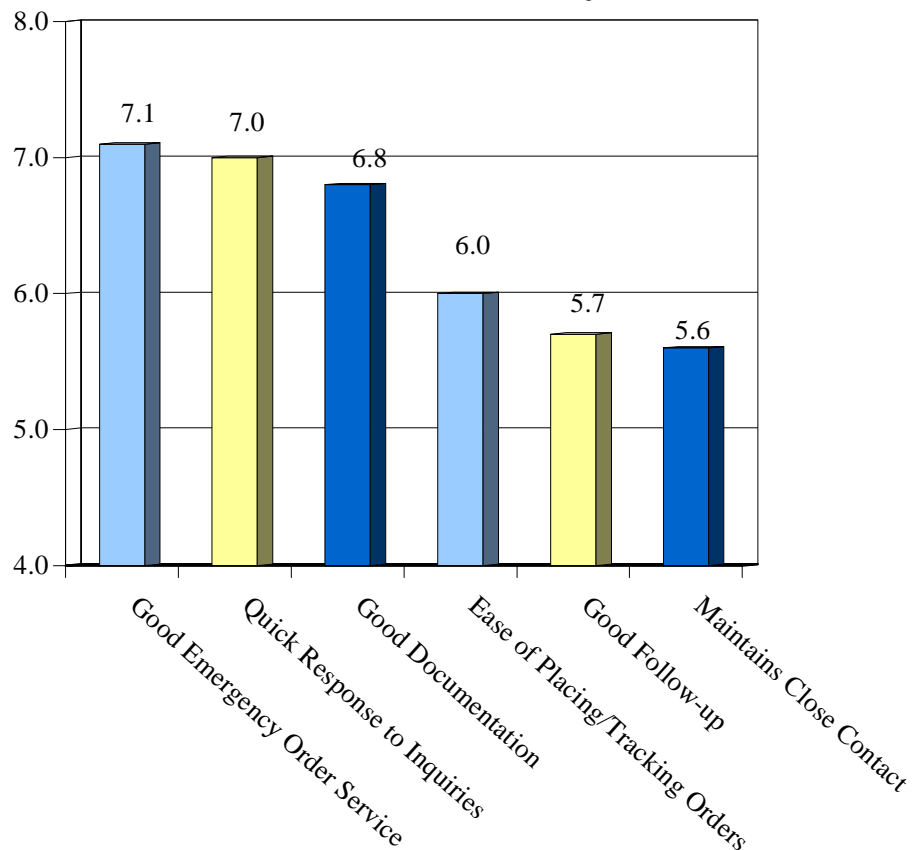
Need for High Caliber of Parts Order-Service

End-users view parts order-service – the fundamental execution of parts orders and ancillary support services associated with the orders – to be almost as crucial as the issues of price and delivery. While this may appear simplistic and obvious, one might be surprised at how many suppliers overlook the basic tenets of serving customers well. As

FIGURE 5

CUSTOMERS' PRIORITIES REGARDING PARTS ORDER SERVICE

(Sample's Rating of Each Factor's Effect on Selection of a Parts
Supplier
0= No Effect, 8= Major Effect)



Source: PMMI

Table 2 indicates, 73.2 percent of the sample rated the factor of “*Quick Response to Parts Inquiries*” as either a 7 or 8 among their priorities. A number of respondents alluded anecdotally to the fact that many machinery and parts suppliers tend to lack a sense of urgency when it comes to handling parts inquiries for needed parts. While inside people on the order desk may be able to furnish a simple parts quote comprised of a few standard items, their response to a more complex request (where they may have to reference a schematic or research a serial number) can sometimes stretch out to days or in extreme cases even weeks. The factor of “*Good Emergency Order Service*” averaged 7.1 on the rating scale (Figure 5, Table 2), and a larger proportion of respondents (79.2%) rated the factor either 7 or 8, reflecting customers’ growing obsession with the need for quick customer service – especially when a packaging line is down or facing the prospect of going down for want of a replacement part.

In addition to the issue of supplier response (whether to normal or emergency order requests), customers consider the “Quality and Completeness of Documentation (e.g., parts lists, manuals, etc.)” to be extremely important as well. As Table 2 indicates, 68 percent of the respondents rated it a 7 or 8 in priority, which resulted in an average rating of 6.8. Clear, explicit, complete and easy to follow documentation can by itself lead to an improvement in customer service by allowing the end-user to be well informed in dealing with the supplier.

TABLE 2
CUSTOMERS’ PRIORITIES REGARDING PARTS ORDER SERVICE

(Sample's Rating of Each Factor’s Effect on Selection of a Parts Supplier

0= No Effect, 8= Major Effect)

Factor	Average Rating (Based on Scale of 0 to 8)	Percent Rating Factor 7 or 8 (%)
Good Emergency Order Service	7.1	79.2
Quick Response to Parts Inquiries	7.0	73.2
Quality and Completeness of Documentation	6.8	68.0
Ease of Placing and Tracking Orders	6.0	40.6
Good Follow-Up on Parts Order Status	5.7	39.3
Maintains Close Contact With Us	5.6	31.0

Source: PMMI

According to the sample's response, the factor ranking fourth in customer order service is "Ease of Placing and Tracking Orders", which averaged a 6.0 rating and was given a 7 or 8 in priority by 40.6 percent of the respondents. Whether having the ability to place and track orders easily by either phone or on-line, customers view this as an important capability. Good follow-up on parts order status – a related issue – ranked close with a 5.7 rating and a 39.3 percent representation rating it in the 7 to 8 range.

The Issue of Parts Quality

As the array of alternative suppliers offering parts for packaging machinery expands, questions arise as to the quality and consistency of the parts available from the alternative suppliers and how concerned end-users are about installing parts that may not be sanctioned by the machinery manufacturers. While the issue is confined largely to replicated proprietary parts offered by non-OEM suppliers, it also extends in some cases to common parts as well.

Not surprisingly, most customers indicated that their leading priority in terms of parts quality is that they "*receive parts of consistent quality manufactured within precise tolerances*". As Figure 6 indicates, the factor had an average rating of 7.0, and as shown in Table 3, it was rated 7 or 8 in a 0-8 scale by 76.3 percent of the sample. Follow-up probing of respondents ratings revealed that for the most part, and with few exceptions, customers

TABLE 3
CUSTOMERS' PRIORITIES REGARDING PARTS QUALITY
(Sample's Rating of Each Factor's Effect on Selection of a Parts Supplier
0= No Effect, 8= Major Effect)

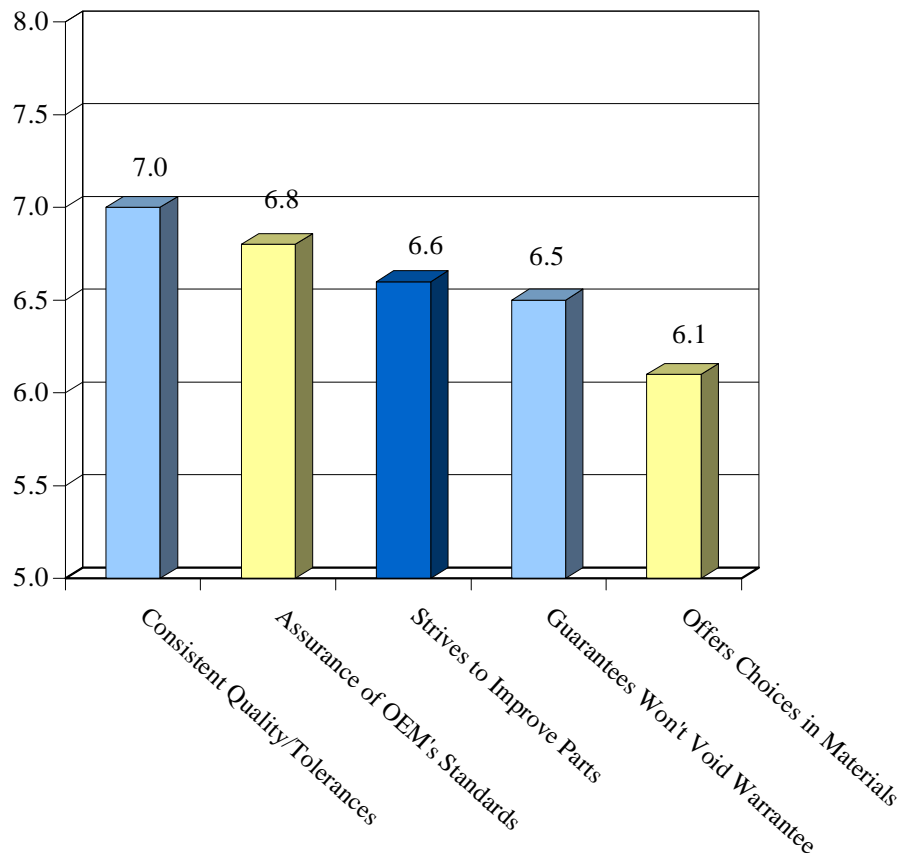
Factor	Average Rating (Based on Scale of 0 to 8)	Percent Rating Factor 7 or 8 (%)
Ensures Consistent Parts Quality and Tolerances	7.0	76.3
Offers the Assurance of OEM Standards	6.8	68.2
Strives to Offer Improved- or Better Performing Parts	6.6	63.3
Guarantees Parts Won't Void Mfr's Warrantee	6.5	63.7
Offers Choices in Parts Materials and Options	6.1	44.3

Source: PMMI

FIGURE 6

**CUSTOMERS' PRIORITIES REGARDING PARTS
QUALITY**

**(Sample's Rating of Each Factor's Effect on Selection of a Parts
Supplier
0= No Effect, 8= Major Effect)**



Source: PMMI

appear to be generally satisfied with the quality of parts they receive. Moreover, “assurance of the parts’ adherence to machinery manufacturers’ OEM standards,” which received an average rating of 6.8, is uppermost in the minds of many customers as well. But it is worth noting that customers also look to suppliers for “improvements in the quality and functionality of the parts”, which can translate into either longer mean time between

failures (MTBF) or better machine operation or both (Please note average rating of 6.6 and that 63.3 percent of sample rated the factor 7 or 8.) The importance that customers attach to parts innovation and improvement is also reflected in the high rating given to the factor of *“offers choices in parts materials and options”*. The findings produced anecdotal evidence of needs for higher grades of stainless steel in some parts as well as for hard coatings on others, such as on augers, to limit abrasive wear. Finally, but perhaps of utmost significance is the concern that any part furnished by other than the OEM *“will not void the manufacturer’s warrantee.”* This factor was rated a 7 or 8 by 63.7 percent of the sample and received an average rating of 6.5 out of 8.0. With some machines costing well into the six figures, many customers are reluctant to jeopardize the manufacturer’s warrantee by installing less costly non-OEM parts.

“If the non-OEMs want to get our parts business, they have to provide us with a signed statement indicating that the parts won’t violate or negate the manufacturer’s warrantee; otherwise we won’t buy from them.” Plant Engineer, Packaged Food Company

The Growing Importance of Technical Expertise and Service/Repair Capabilities

The essential link between a company’s role as not only a supplier of parts, but also as a source of good technical assistance with the capability to perform complete machinery repairs was clearly brought out in the research. For as packaging machines become more complex, plant maintenance personnel are challenged to keep up with the technology; consequently, end-users are increasingly relying on their suppliers for assistance. In fact, for many end-users, the selection of a machinery and parts supplier can often hinge on the technical capabilities of a supplier. The following quote exemplifies the crucial

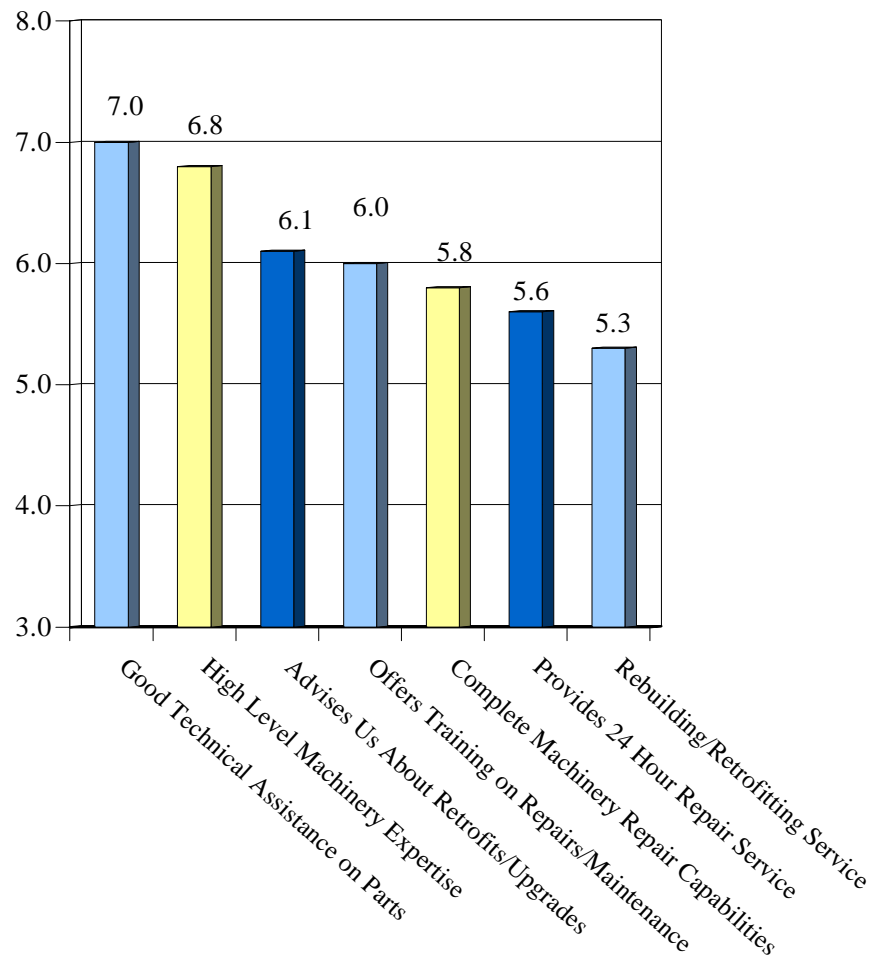
“We try our best to stick with a supplier that offers us good technical back-up and assistance and we’ll try to buy that company’s machine whenever possible. We want to deal with someone we know and can trust.” Maintenance Manager Pharmaceutical Company

importance of the role that technical expertise and service repair capabilities play in the market today – a factor equally reflected in the study’s data. As Figure 7 and Table 4 indicate, end-users rated “*good technical assistance on parts*” first among their supplier selection priorities in that area, which was followed

FIGURE 7

CUSTOMERS' PRIORITIES REGARDING SUPPLIERS' TECHNICAL EXPERTISE AND SERVICE REPAIR CAPABILITIES

(Sample's Rating of Each Factor's Effect on Selection of a Parts Supplier
0= No Effect 8= Major Effect)



Source: PMMI

TABLE 4
CUSTOMERS' PRIORITIES REGARDING TECHNICAL EXPERTISE AND
SERVICE REPAIR CAPABILITIES OF THEIR SUPPLIERS

(Sample's Rating of Each Factor's Effect on Selection of a Parts Supplier

0= No Effect, 8= Major Effect)

Factor	Average Rating (Based on Scale of 0 to 8)	Percent Rating Factor 7 or 8 (%)
Offers Good Technical Assistance on Parts	7.0	70.9
Possesses High Level of Machinery Expertise	6.8	72.5
Advises us About Retrofits and Upgrades	6.1	45.5
Offers Training on Repairs and Maintenance	6.0	46.7
Offers Complete Machinery Repair Capabilities	5.8	43.4
Provides 24 Hour Repair Service	5.6	45.1

Source: PMMI

closely by “*high level of machinery expertise*”. And consistent with the growing use of retrofitting as a means of upgrading existing machinery to approach current state-of-the-art technology, respondents also indicated that “*being advised about retrofits and upgrades*” is also important to them, as was “*offers training on repairs and maintenance.*”.

In-Depth Analysis of Parts Manufacturers' Market Shares by Category of Parts

Whereas the initial discussion about where the parts dollars are going provided an overview of the market-share breakdown by type of supplier, the analysis that follows looks at the subject in greater detail, not only in terms of percentages and trends, but also delves into the reasons behind the market shares held by the principal manufacturers of parts.

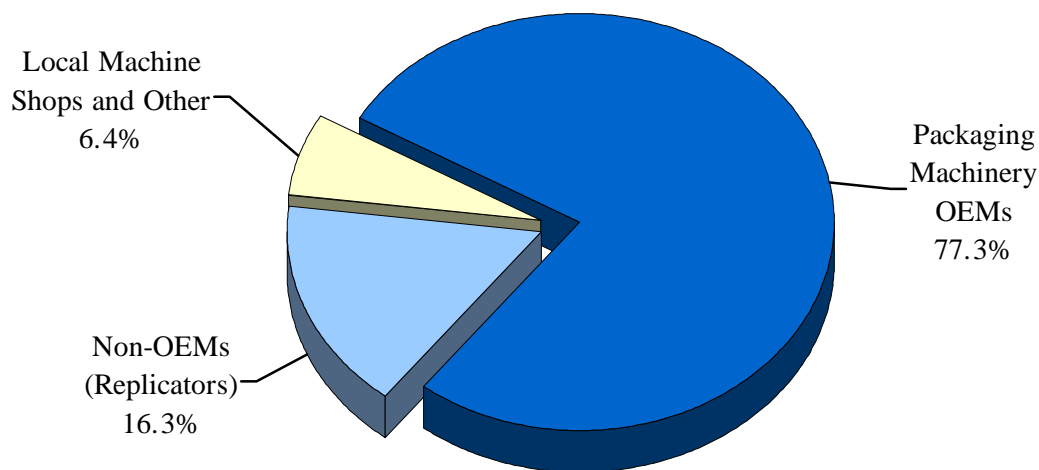
Proprietary Parts

In 2004, North American packaging machinery manufacturers accounted for 77.3 percent of the proprietary parts sold for their existing packaging machines – either through their own direct sales representation or through their service organizations, distributors and/or other

resellers. As Figure 8 indicates, non-OEMs – essentially parts replicator companies – were responsible for 16.3 percent of the total– also either through direct sales, distributors, service firms, or other resellers. The 6.4 percent balance was made up largely by machine shops contracted by end-users to furnish or replicate parts on a custom basis. Technically they can also be considered non-OEMs, but for purposes of this research, it was deemed appropriate to differentiate them from the rest. Taken together, though, they accounted for nearly 23 percent of the proprietary packaging machinery parts business generated in 2004. Included among the most common types of parts replicated by non-OEM suppliers are augers, formers, funnels, pump rotors, nozzles, feeding screws, star wheels, timing screws, blades, and shafts.

FIGURE 8

**U.S 2004 DOMESTIC SALES OF PROPRIETARY
PACKAGING MACHINERY PARTS BY PRINCIPAL
SOURCE OF SUPPLY
(Percent of Total Dollar Value)**



Source: PMMI

Reasons End-Users Go to Non-OEM Sources for Proprietary Parts

In line with the axiom stated at the beginning of this section (which posited that the two most widely cited issues of dissatisfaction among customers are that [1] parts prices are too high and [2] delivery is too slow), it was found that customer dissatisfaction with packaging machinery OEMs' prices and delivery *have been* the primary motivating factors causing them to look elsewhere for parts. As Figure 9 and Table 5 clearly indicate, respondents using non-OEM parts cited price and delivery above all other factors as their main reasons for going that route. It is important to emphasize, however, that the findings also revealed other factors exerting a strong influence on those decisions, either separately or in combination. For although price and delivery advantages may initially afford non-OEM suppliers a "foot in the door opportunity" with end-users, research findings have conclusively affirmed that once non-OEMs gain entrance, many have been able to solidify their credibility by demonstrating proficiency beyond merely lower prices and faster deliveries.

Lower Prices While the price spreads between OEM and non-OEM parts prices vary widely according to manufacturer, category of machine, and type of part, there is no doubt that non-OEMs typically offer a lower price option. A large proportion of the

TABLE 5
PRINCIPAL REASONS END-USERS ORDER NON-OEM PACKAGING
MACHINERY PROPRIETARY PARTS

(Sample's Rating of Each Factor's Effect on Their Decision: 0 = No Effect, 8 = Major Effect)

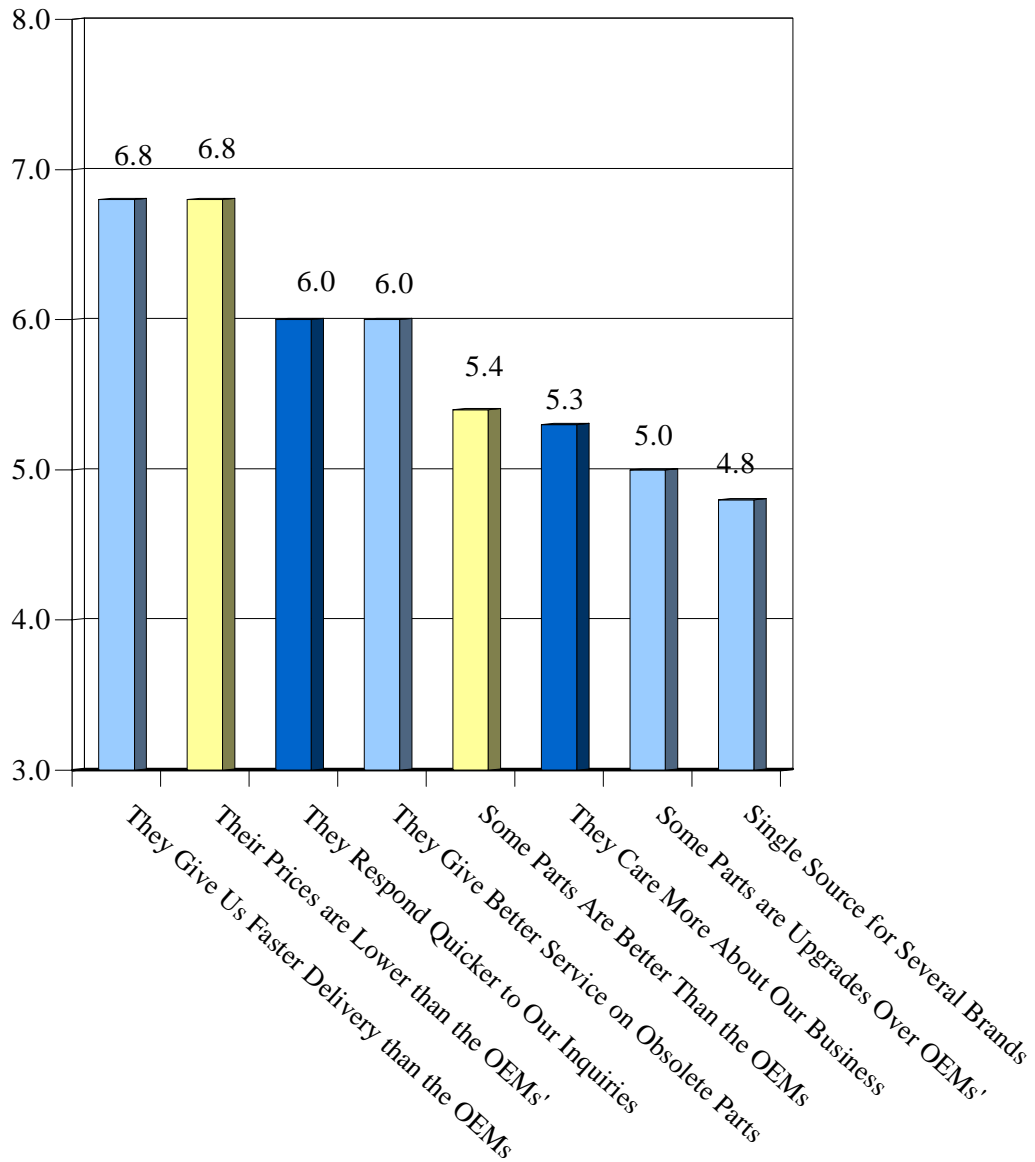
Factor	Average Rating (Based on Scale of 0 to 8)	Percent Rating Factor 7 or 8 (%)
They Give Us Faster Deliveries than the OEMs	6.8	69.6
Their Prices are Lower than the OEMs'	6.8	65.5
They Give us Better Service on Obsolete Parts	6.0	52.3
They Respond Quicker to Our Inquiries than OEMs	6.0	41.4
Some Parts are Better Quality than the OEMs'	5.4	35.5
They Care More About Our Business than the OEMs	5.3	31.9
Their Parts are Upgrades in Performance Vs. the OEMs	5.0	27.6
They are a Single Source for Several Machine Brands	4.8	24.7

Source: PMMI

FIGURE 9

**PRINCIPAL REASONS END-USERS ORDER NON-OEM
(REPLICATED) PROPRIETARY PARTS**

**(Sample's Rating of Each Factor's Effect on Their Decision:
0 = No Effect, 8 = Major Effect)**



Source: PMMI

orders placed with non-OEMs for proprietary parts strictly on the basis of lower price involve either older machines where violation of manufacturers' warrantee is not an issue, or proprietary *wear-parts* (e.g. augers), which may be replaced frequently. And as discussed later, lower-priced change parts are very commonly bought from non-OEMs.

Faster Delivery of Parts and Quicker Response to Inquiries

As Table 5 indicates, 69.6 percent of the respondents ordering non-OEM (proprietary) parts cited faster delivery as a major reason for their doing so (rating the reason either a 7 or 8 out on a 0-8 scale), and 41.4 percent indicated in similar fashion that the non-OEMs respond quicker to parts inquiries. This correlates with earlier discussion showing the two factors listed among the top priorities that customers consider when selecting suppliers of parts for their packaging machinery.

Better Service on Obsolete Parts

One of the more contentious issues brought out in the research – both anecdotally and in manufacturers' rating data – was the generally poor service provided by machinery manufacturers on obsolete parts. While not all OEMs were the targets of customers' criticism, the issue was nonetheless prevalent among enough of them to generate ire throughout much of the market. In fact, the situation of extended deliveries, delays in quotations, and relatively high prices charged by the OEMs for obsolete parts has allowed the non-OEMs to exploit one of their easiest market opportunities. As Table 5 indicates, over half of those using non-OEM parts (52.3%) cited the factor of "better service on obsolete parts" as a primary reason for dealing with the OEMs, by rating the factor either a 7 or 8 on the 0-8 scale.

"Some of our relatively new packaging machines became obsolete in just a few years and we've had a difficult time getting parts from the manufacturers. Rather than wasting time going to the OEMs, we know from experience it's a whole lot quicker to go to a knock-off supplier or a local machine shop." Plant Engineer, Food Company

Some Non-OEM Parts Perceived as Better Quality

Due in part to the focus that non-OEM suppliers have maintained on replicating parts, as well as to the promotion of their precision machining capabilities and expertise, many customers have come to perceive certain of the replicated parts as being actually higher in quality than those offered by the original machinery manufacturers. The higher quality perception may relate to the wider selection of materials of construction available from the non-OEMs or simply to the assurance of precise machining tolerances given to them by “specialists” in the field. Evidence of the customers’ opinions in that regard is reflected in the data showing that over a third of the respondents cited “better quality” as a prime 7 or 8 rated factor.

The Impression of Caring More about Their Customers’ Business

In line with the opinion held by many end-users that machinery manufacturers don’t seem to care enough about their customers after the machine sale is made, nearly one third of those using non-OEM parts claimed that non-OEM suppliers care more about customers than the machinery manufacturers do. As Table 5 indicates, the factor was rated 7 or 8 by 31.9 percent of those ordering from non-OEMs as being a key factor in their decision to buy parts from them rather than from the manufacturers.

A Particular Focus on Change Parts

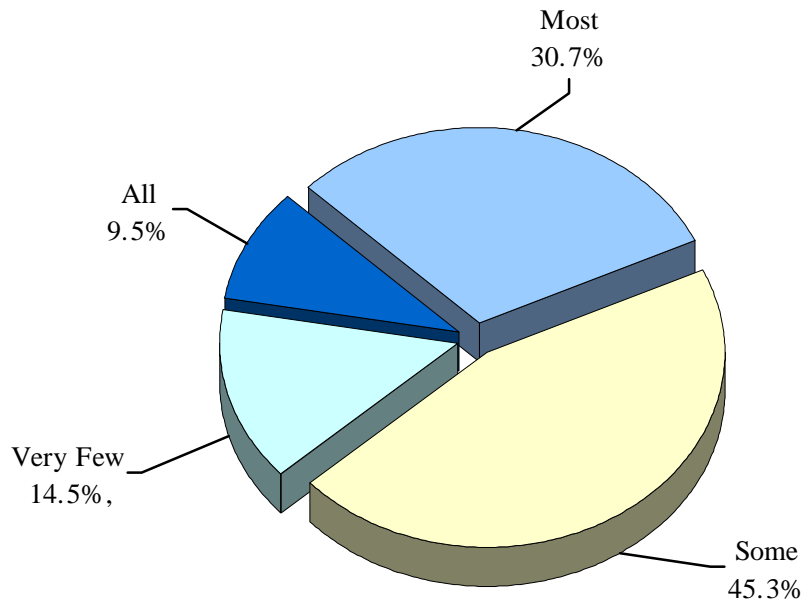
Nearly half of the sample’s companies (45.3%) order some quantity of change parts, such as timing screws and star wheels, from non-OEM suppliers on an annual basis. In fact, as Figure 10 indicates, 30.7 percent of those reported ordering most of their required change parts from non-OEM suppliers and 9.5 percent order all from non-OEMs. Nearly half (45.3%) obtain some from them and only 14.5 percent said they order very few.

When asked why they use replicated *change parts* instead of OEM change parts, 84 percent cited lower prices, and 63.5 percent indicated the quicker service they receive from the non-OEMs – essentially the basic theme revealed throughout the study. But it is particularly worth noting that almost half (45.2%) gave recognition to the fact that several non-OEM suppliers specialize in change parts, which boosts their credibility as

FIGURE 10

**APPROXIMATE PORTION OF CUSTOMERS' ANNUAL
CHANGE PARTS REQUIREMENTS ORDERED FROM
NON-OEM SUPPLIERS**

(Percent of Quantity Ordered by Those Using Non-OEM Parts)



Source: PMMI

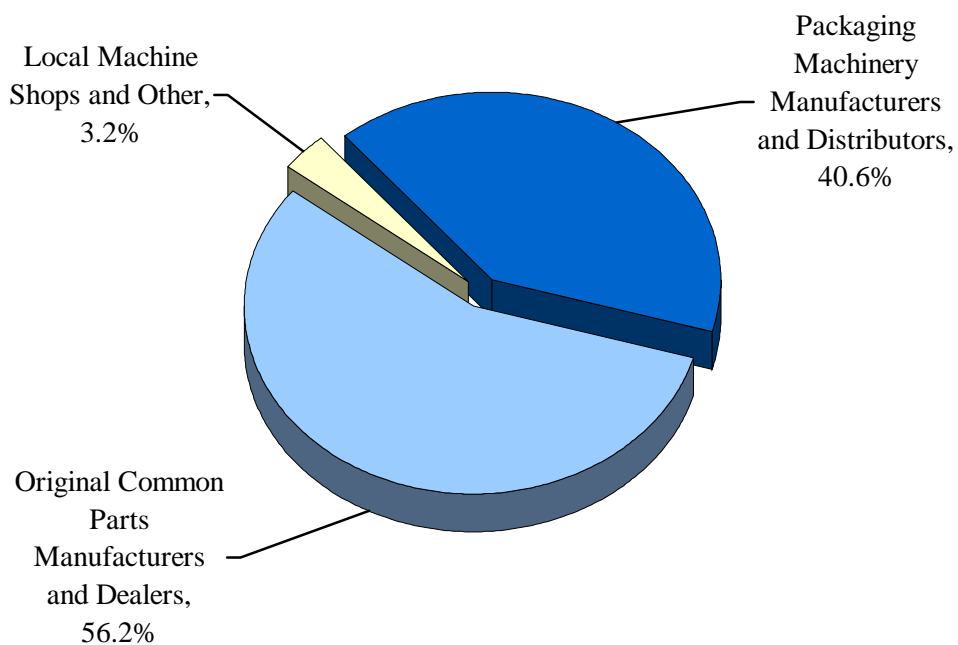
specialist suppliers. In fact, over a third of the respondents (35.6%) believe that some of the non-OEMs manufacture change parts for the machinery OEMs.

Common/Commercial Parts

According to a projection of the findings, packaging machinery manufacturers and their distributors captured an estimated 40.6 percent of the total 2004 market (in \$) for common parts used on packaging machinery in the U.S. (Figure 11). By the same token, however,

the majority of the business (59.4%) went to other suppliers. The parts and components OEMs, (e.g. manufacturers of motors, cylinders, valves, controls, PLCs, etc.) and their dealers accounted for 56.2 percent and local machine shops and other miscellaneous suppliers took in the 3.2 percent balance.

FIGURE 11
U.S 2004 DOMESTIC SALES OF
COMMON (COMMERCIAL)
PACKAGING MACHINERY PARTS BY PRINCIPAL
SOURCE OF SUPPLY
(Percent of Total Dollar Value)



Source: PMMI

Although the packaging machinery manufacturers' (40.6%) share of the common parts volume is considerably lower than their corresponding 77.3 percent share of proprietary parts sales, the obvious primary reason behind the difference is that these are manufactured by others, the fact of which end-users are generally well aware. As discussed earlier, many end-users require the packaging machinery manufacturers to provide a cross reference of their part numbers with the original common parts manufacturers' numbers so they may source the parts directly from the common parts suppliers.

Reasons End-Users By-Pass Machinery Manufacturers for Common Parts

It should come as no surprise to anyone close to the industry that end-users order common parts directly from the common parts manufacturers and their dealers expressly because: (1) their prices are lower than those of the machinery manufacturers and (2) their deliveries are faster (Table 6.). While the rating scores associated with the reasons for using alternative suppliers for common parts are nearly identical to those recorded for

TABLE 6
PRINCIPAL REASONS END-USERS ORDER PACKAGING MACHINERY
COMMON PARTS FROM ALTERNATIVE SUPPLIERS

(Sample's Rating of Each Factor's Effect on Their Decision: 0 = No Effect, 8 = Major Effect)

Factor	Average Rating (Based on Scale of 0 to 8)	Percent Rating Factor 7 or 8 (%)
Their Prices are Lower Than the OEMs	7.1	76.3
They Give Us Faster Deliveries than the OEMs	6.6	70.1
They Respond Quicker to Our Inquiries than OEMs Do	5.9	48.6
They are a Single Source for Several Mach'y Brands	5.2	37.6
They Care More About Our Business than the OEMs	4.8	28.4

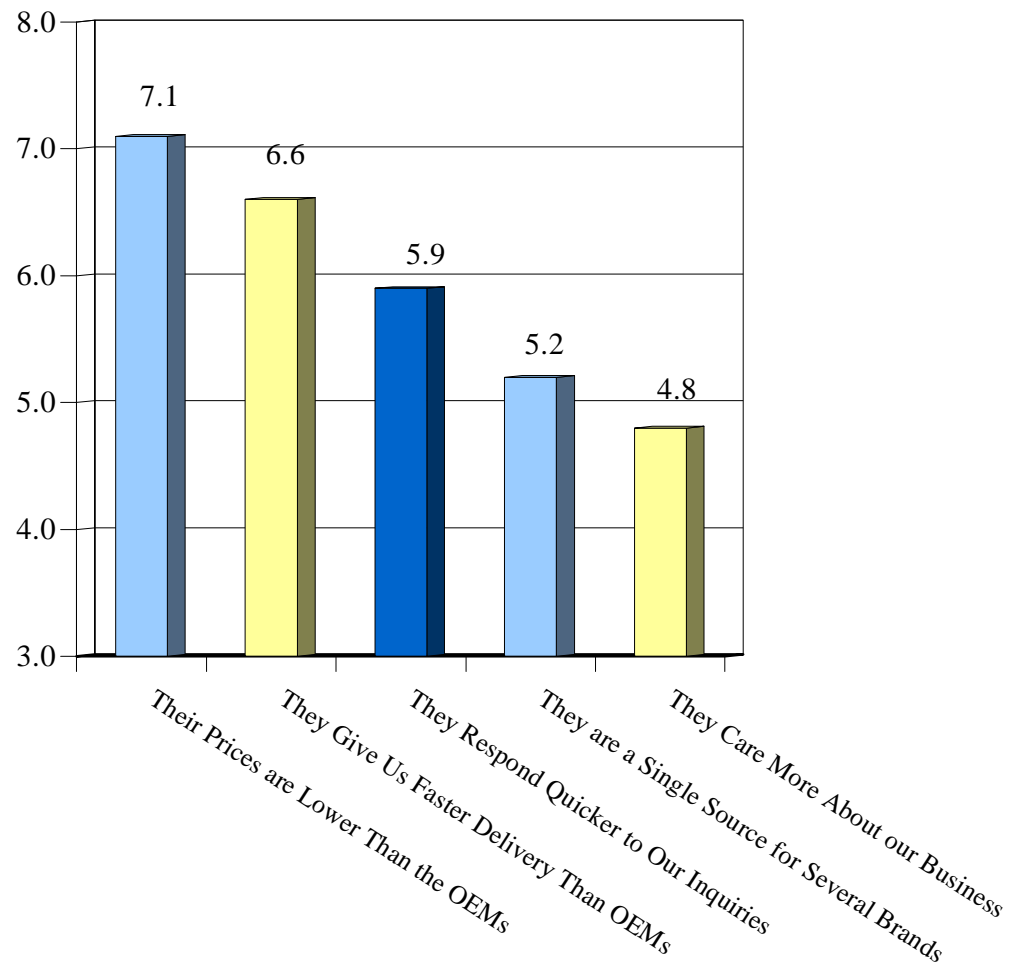
Source: PMMI

proprietary parts (compare Tables 6 with Table 5), there *are* significant differences between the two. Foremost, since common parts are themselves outsourced by the OEMs to be incorporated into their respective machines, they are thus are considered genuine.

FIGURE 12

**PRINCIPAL REASONS END-USERS ORDER PACKAGING
MACHINERY COMMON PARTS FROM ALTERNATIVE
SOURCES OF SUPPLY**

**(Sample's Rating of Each Factor's Effect on Their Decision:
0 = No Effect, 8 = Major Effect)**



Source: PMMI

As a consequence, end-users installing appropriate common parts obtained from other than the machinery manufacturers do not run the risk of violating the machinery manufacturer's warrantee for doing so. But more to the point, end-users have found that going directly to the common parts manufacturers rather than to the machinery

manufacturer can save them money. For as being essentially parts resellers in the case of common parts, many of the machinery manufacturers mark up common parts required for their machines to price levels considerably higher than those typically charged by the common parts manufacturers or dealers. While follow-up probing revealed that a portion of the end-users appear willing to pay a *slight* premium for common parts supplied by the machinery manufacturers, they are adamant about not paying exorbitant prices that many of the OEMs charge (please note quotation below.)

“The parts price mark-ups by some of the packaging machinery manufacturers are outrageous. We only go to the original suppliers now like Rockwell and Parker Hannifin. If the machinery manufacturers would keep their mark-ups reasonable, we’d consider going back to them, but I doubt they’ll do it.” Maintenance Superintendent Beverage Bottling Company

End-users claim that in addition to lower prices, they generally receive much quicker response to inquiries from the common parts suppliers and faster parts deliveries. Owing to the fact that those suppliers specialize in common parts, they usually have a large selection of parts in stock and are accustomed to giving fast turnaround service – often same day delivery. As Table 6 and Figure 12 indicate, respondents also cited the convenience of dealing with a single source of parts for several brands; although just slightly over a third of those ordering from common parts suppliers consider that to be a *major* reason for dealing with them.

It is interesting to note that slightly more than a quarter of the defined sample voiced their opinion (via the rating scale) that common parts suppliers seem to care more about customers’ parts business than the machinery manufacturers do, and for that reason, among others, they prefer to by-pass the machinery manufacturers on common parts orders.

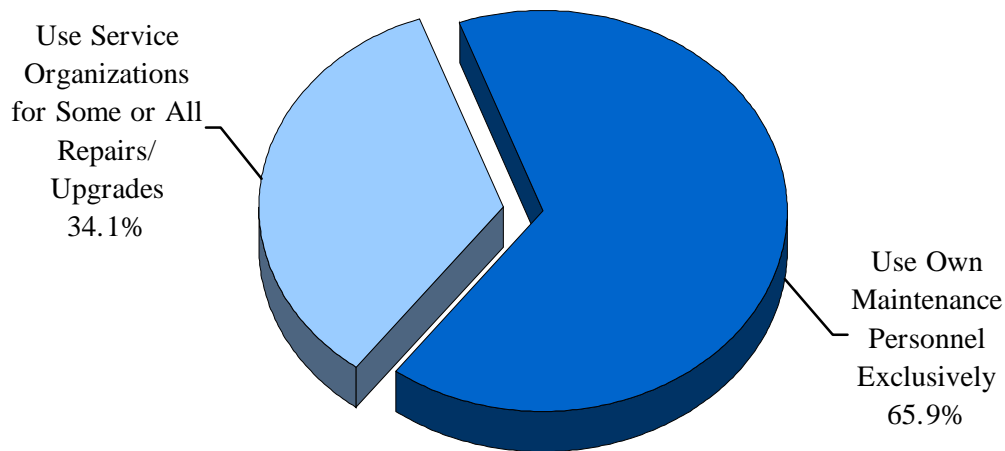
Parts Installed in Conjunction with Contracted Service Work Performed

Just over 34 percent of the sample's companies use service repair organizations to repair, maintain, retrofit or perform other work on their respective packaging machines. Therefore, 66 percent typically handle all their own repairs and upgrades using in-house maintenance personnel (Figure 13).

As indicated earlier in Figure 1, approximately 7.5 percent of the packaging machinery parts obtained by end-users in 2004 were ordered from service firms performing repairs and/or overhaul work on customers' machinery. But in addition to parts expenditures by end-users that were included as a portion of service invoices (where the service organizations billed for

FIGURE 13

**PROPORTION OF THE SAMPLE'S COMPANIES
USING SERVICE ORGANIZATIONS VERSUS THEIR OWN
MAINTENANCE PERSONNEL FOR REPAIRS/UPGRADES OF
THEIR EXISTING PACKAGING MACHINES
(Percent of Sample)**



Source: PMMI

both parts and labor), service firms also installed parts that had previously been ordered and paid for separately by end-users. The data in Table 7 provide a percentage analysis of the projected dollar value of parts installed by service firms in customers' packaging machines in 2004 – cross tabulated by type of service activity and by type of service firm. Not surprisingly, the original packaging machinery manufacturers were responsible for the largest

TABLE 7
ANALYSIS OF PARTS DOLLAR VOLUME GENERATED IN CONJUNCTION
WITH SERVICE WORK PERFORMED BY TYPE OF SERVICE FIRM

(Percent of Parts \$ Volume Installed by Service Organizations)

Type of Service Organization	Scheduled Maintenance and Routine or Emergency Repairs (%)	Machine Overhauls and Retrofits (%)
Original Packaging Machinery <i>Manufacturer's</i> Service Organization	47.8	51.7
Original Packaging Machinery Manufacturer's <i>Distributor</i> Organization	20.6	17.5
<i>Competing*</i> Machinery Manufacturer's or Distributor's Service Organization	6.6	7.7
<i>Independent**</i> Service Firm	25.0	23.1
TOTAL	100.0	100.0

*Competing refers to a packaging machinery manufacturer's service firm servicing a brand of packaging machinery other than their own

** Independent service firm not associated with any packaging machinery manufacturer or distributor.

Source: PMMI

share of the contracted work on their own respective brands of machinery – both for scheduled maintenance and routine and emergency repairs (47.8%) as well as overhauls and retrofits (51.7%). However, according to the data, the second largest shares (25.0% and 23.1%, respectively), are held by independent service companies (not associated with any packaging machinery manufacturer or distributor). Service departments of the original manufacturers' distributor organizations ranked next, followed by service organizations of packaging machinery manufacturers or distributors working on competing brands of machinery (i.e. servicing a brand of machinery other than their own) were responsible for the smallest proportion of the volume.

Why End-Users Hire Service Organizations Other than Those of the Machinery OEMs or Their Distributors

While the original machinery manufacturers and their authorized distributors arguably account together for the lion's share of the service on packaging machinery in the U.S.,

TABLE 8
PRINCIPAL REASONS END-USERS HIRE SERVICE FIRMS OTHER THAN THOSE OF THE ORIGINAL MACHINERY MANUFACTURERS AND THEIR DISTRIBUTORS

(By Percent of Respondents Who Reported Using Alternative Service Firms)

Reason	Percent of Total (%)
The Others Respond Quicker to our Service Needs than the OEMs	51.4
The Others Charge Less for Service Work than the OEMs	48.6
The Others are More Knowledgeable than OEMs or their Distributors	10.8
The Others are More Flexible and Accommodating than the OEMs	8.1
We Prefer to Use Local Companies	5.4
We Went to Others After Bad Experiences With OEMs	5.4
Other*	16.2

*Other includes: They specialize in calibration; they go the extra mile for us; their work is high quality, they're reliable and dependable; OEMs give poor support

NOTE: Exceeds 100.0 percent because several respondents gave multiple reasons.

Source: PMMI

roughly 24 percent of the parts volume (23.1%-25%) associated with service work nonetheless went to independent service companies and about seven percent to competing brand service companies in 2004. When asked why they hire alternative service organizations, respondents gave a wide range of reasons, but the major theme evoked two main issues revealed earlier in conjunction with the discussion of direct parts purchases: (1) Quicker response/faster service and (2) Lower cost. As Table 8 indicates, 51.4 percent of those using firms other than the OEMs or their distributors stated that the other service firms both respond quicker and get the job done faster, while 48.6 percent cited lower hourly or set job rates as their principal reasons.

“The price we pay to the local service repair shop is significantly lower than what we’d have to pay the OEM. We’ve dealt with these guys a long time; they’re knowledgeable and very reliable.” Plant Engineer, Food Products Company

It is worth noting that 10.8 percent consider the other service firms to have better knowledge about the machinery than the manufacturers’ authorized service organizations. While this may at first blush seem odd considering that the manufacturers of the machines should be the *most* knowledgeable about servicing their machinery, follow-up probing of the responses found that certain of the independent repair companies employ expert service technicians with many years of experience behind them, some of those years originally with the OEMs. End-users not only have full confidence in their technical abilities, but they put complete trust in them for the operation of their packaging machines. As the table also indicates, the balance of the reasons deal with other aspects of good service the alternative firms provide as well as dissatisfaction with past services of OEMs.

Retrofitting Existing Packaging Machinery

With the rapid advance of packaging machinery technology in recent years, an increasing number of end-users have opted to retrofit their existing packaging machines with current state-of-the-art components as a means of upgrading without having to invest in a complete new machine. The growth of retrofitting has been facilitated by the proliferation of retrofit

kits made readily available largely by the machinery manufacturers, but also of late, by alternative suppliers as well. The following analysis addresses several aspects of this trend.

Extent of Retrofit Activity and Market Shares by Type of Supplier

To determine the extent of retrofitting activity in the market, all respondents were asked:

“Within the past two years, have any of your existing packaging machines been retrofitted with new, higher tech components to bring the machines up to a higher level of technology and performance?”

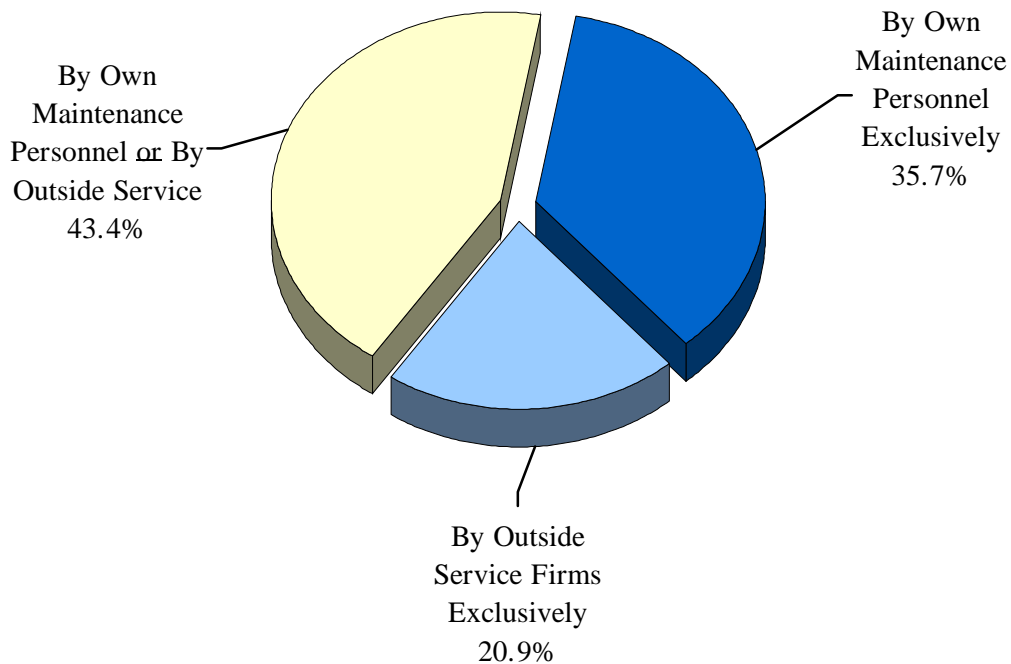
The data revealed that 59.1 percent of the sample’s plants/companies had one or more existing packaging machines retrofitted within the past two years. With respect to the relatively high percentage, however, it is important to point out that *retrofitting* may have a different connotation among different end-users. To some, a retrofit may involve merely the replacement of an older control valve with a newer model, which is promoted as being more reliable, but not necessarily affording upgraded performance. And to others it may suggest a reconfiguration to accommodate a change in conditions of service for the machine – again rather than retrofitting the machine for upgraded performance. Therefore, despite the inclusion of a definition of retrofitting within the question, the true indicator of retrofitting activity is likely to be slightly lower than the 59.1 percent raw data derived from the response. In that regard, a further assessment of retrofitting’s extent in the market can be deduced from the following expanded examination of the subject:

How Retrofits Have Been Installed

As Figure 14 illustrates, 35.7 percent of the respondents indicated that their own maintenance personnel exclusively carried out the retrofits, but the majority – 43.4 percent – reported that in some cases their own personnel did the work and in others outside service firms handled the retrofits. Only 20.9 percent indicated that they have relied entirely on outside service firms for whatever retrofitting was performed. Adding the 43.4 percent (representing both own personnel and outside service) to the 35.7 percent (own personnel exclusively) reveals a theoretical 79.1 percent share handled by companies’ own service personnel. By the same logic, however, service firms

FIGURE 14

**HOW PACKAGING MACHINERY RETROFITS
HAVE BEEN IMPLEMENTED**
(By Percent of Those Reported Retrofits Implemented)



Source: PMMI

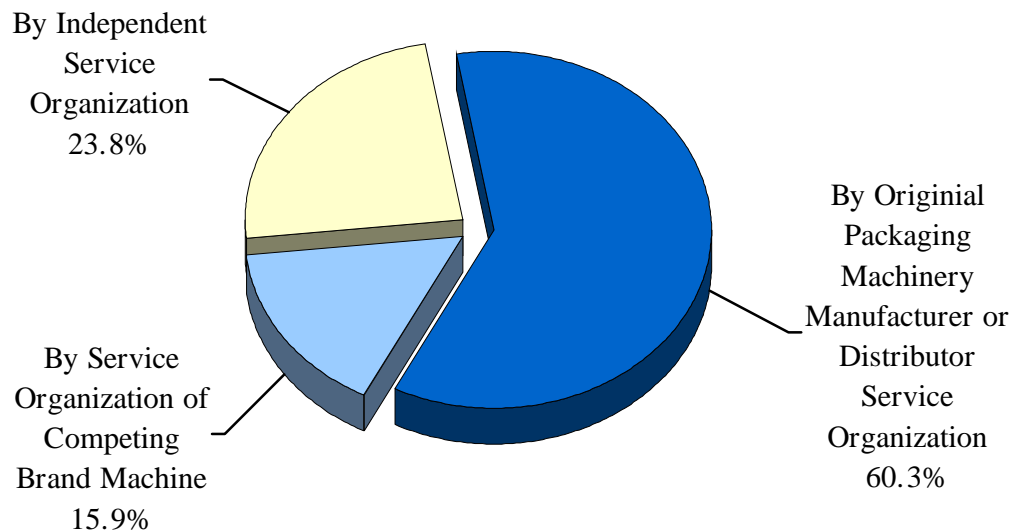
theoretically accounted for an overlapping 64.3 percent share. Follow-up probing of respondents' answers revealed that end-users have typically contracted with service organizations when their own maintenance personnel were either too busy to take on the work or were deemed technically incapable of performing the particular retrofits. Also, some with even highly competent maintenance crews have opted for outside service for some of the more complex retrofits.

Retrofits Performed by Service Organizations

For retrofit installations performed only by outside service organizations (theoretically 64.3 percent as indicated above), over 60 percent of the sample's respondents reported that the original packaging machinery's service organization and/or their authorized distributors did the work. As Figure 15 also shows, 23.8 percent indicated that independent service firms installed the retrofit, and 15.9 percent said that the work on their machines was performed by service organizations of competing brand machines (e.g., a service organization from one brand of packaging machine working on a competing brand machine.)

FIGURE 15

**TYPES OF SERVICE ORGANIZATIONS
PERFORMING THE RETROFITS
(By Percent of Those Reported Retrofits Implemented by
Service Organizations)**



Source: PMMI

How Satisfied End-Users are with the Outside Service Firms' Retrofit Work

The vast majority of the sample's respondents whose respective plants contracted with outside service organizations to perform retrofits have been very satisfied with their work. Most importantly, the OEMs' and/or their authorized distributors' service received the best reviews, with 63.2 percent of the respondents claiming to be "very satisfied" with their work (Table 9) and only 34.2 percent just "somewhat satisfied." The majority of those using independent service companies (not associated with a packaging machinery supplier) were also very satisfied with how the work was performed. Only end-users that contracted with competing machinery brand service firms (machinery service firm working on a competing brand of machinery) were not as enthusiastic about the results. Irrespective of the degrees of satisfaction reported, it is worth noting that only 2.6 percent of the respondents using outside service were *dissatisfied* with the service they received.

TABLE 9
END-USERS DEGREES OF SATISFACTION WITH SERVICE
ORGANIZATIONS' RETROFIT INSTALLATIONS

<u>Type of Service Organization</u>	<u>Very Satisfied</u> (%)	<u>Somewhat Satisfied</u> (%)	<u>Not Satisfied</u> (%)	<u>TOTAL</u>
Original Packaging Machinery Manufacturer's or Distributor Service	63.2	34.2	2.6	100.0
Independent Service	58.3	41.7	0.0	100.0
Competing Machinery Brand Service	33.3	66.7	0.0	100.0

Source: PMMI

The following sampling of respondents' comments reflects the positives that contributed to their satisfaction with the service organizations they hired:

"The equipment worked great when they were done. The price was better than they quoted and they gave us good training." User of OEM's service firm

"They were knowledgeable and efficient. We could tell they knew what they were doing." User of OEM service firm

"They're a local company that always works within our time schedule and meets our safety and security requirements." User of independent service firm

"The machine was down only for the scheduled time and worked according to plans. We like using them because they're local and if something goes wrong, they're here quickly." User of independent service firm

"The OEM truly has the expertise and technical competence. We only feel comfortable using them." User of OEM service firm

Suppliers of Retrofit Kits (To End-Users for Installation by Own Maintenance Crews)

Of the respondents who indicated that their own maintenance personnel performed the retrofits (35.7% exclusively + 43.4% by either own personnel or outside service), 58.2 percent reported that they used *retrofit kits* to do so. And of those, 74.7 percent indicated that the kits they used were supplied exclusively by the original packaging machinery manufacturers (Figure 16). Actually the percentage is slightly higher (79.9%) since an additional 1.7% reported that some of their kits were supplied by the OEMs and some by non-OEMs. By the same token, however, 23.6 percent indicated that they used kits supplied exclusively by non-OEMs, and then adding the 1.7 percent reveals a 25.3 percent overlapping share for the non-OEMs.

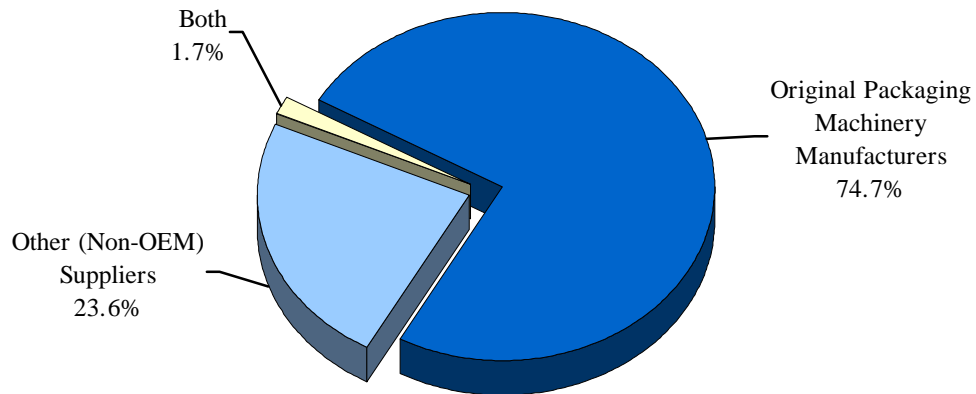
Comparison of End-Users' Degrees of Satisfaction with Retrofit Kits Supplied by OEMs and Non-OEMs

In light of the growing importance that retrofit kits appear to be achieving in the marketplace, the study focused in on the question of how satisfied end-users have been

FIGURE 16

SUPPLIERS OF RETROFIT KITS -- OEMS VS OTHERS

(By Percent of Those Reported Retrofits Performed)



Source: PMMI

with the various kits offered by the OEMs and the non-OEMs, and compared the degrees of satisfaction between the two based on three parameters:

1. The degree to which the retrofit kits improved the machines' performance
2. The ease of installation
3. The quality of technical assistance provided by the suppliers

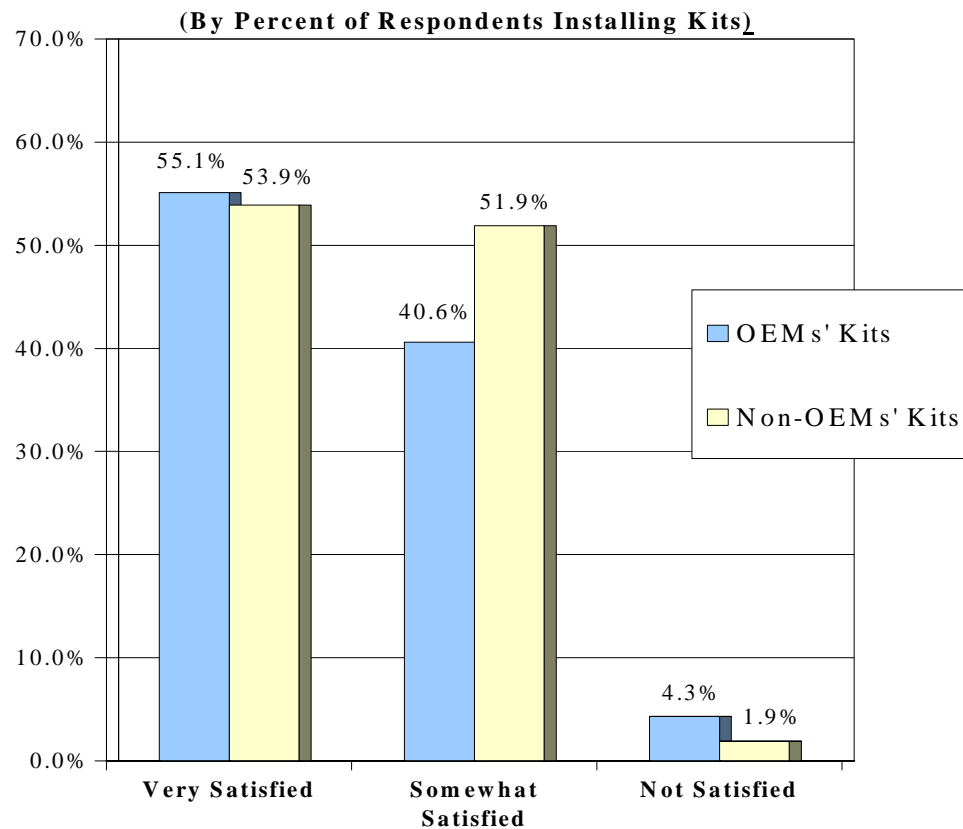
The findings, which appear graphically in Figures 17 through 19, reveal that the majority of end-users have been less than completely satisfied in all three parameters with the retrofit kits furnished by either the OEMs or non-OEMs. For the most part, they have been merely somewhat satisfied, clearly indicating room for improvement. By the same token, however, only a small proportion of respondents reported being actually dissatisfied with the kits they installed. Only those who reported not being very satisfied were asked for their comments as to why.

Assessment of Machinery-Performance Enhancement

As Figure 17 indicates, 55.1 percent of the respondents using OEM retrofit kits indicated that they have been very satisfied with how the kits improved their machines' performance, though a slightly lesser 53.9 percent of those having installed the non-OEM kits also voiced a high degree of satisfaction. Among the respondents whose assessments of the kits' performance improvement reflected a less-than-outstanding rating, the complaints varied, but most simply indicated that the results were less than expected.

FIGURE 17

**DEGREE OF END-USERS' SATISFACTION WITH HOW
RETROFIT KITS IMPROVED MACHINES' PERFORMANCE
OEMS KITS VERSUS NON-OEM KITS**



Source: PMMI

Ease of Installation

A smaller proportion of the sample's respondents indicated that they were completely satisfied with the ease of installing the retrofit kits supplied by both the OEMs and non-OEMs compared with the findings relating to performance enhancement,. As Figure18 illustrates, only 39.1 percent of those with OEM kits and 46.2 percent with non-OEM kits found them very easy to install; rather, most (53.6% and 51.9%, respectively) were merely *somewhat* satisfied with the ease of installation. From

"The installation was extremely complicated. It took our people much longer than we expected." User of OEM retrofit kit

"The OEM's parts and set-up proved they did not do their homework, even after pre-audit." User of OEM retrofit kit

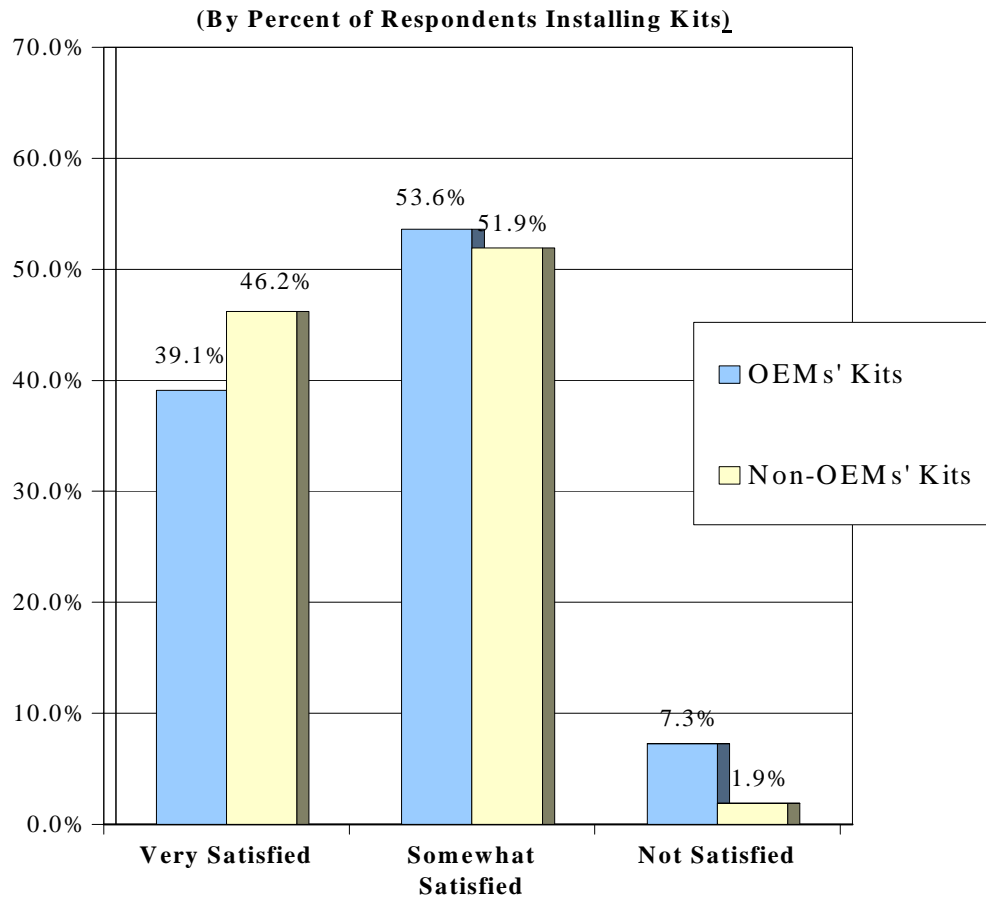
follow-up probing of the responses, it appears that many of the end-users were not fully prepared for the complexity of the retrofits and felt that they were not adequately informed by the suppliers ahead of time as to what they would be up against. And as will become evident, much of the problem has its origin in the combination of inadequate documentation, instructions, and suppliers' technical assistance.

"We had difficulty with matching up the parts. It made the installation more complicated than it should have been." User of non-OEM retrofit kit

"It was just not as simple as they made it out to be. We had to struggle to get it all together." User of non-OEM retrofit kit

FIGURE 18

**DEGREE OF END-USERS' SATISFACTION WITH
RETROFIT KITS' EASE OF INSTALLATION
OEMS KITS VERSUS NON-OEM KITS**



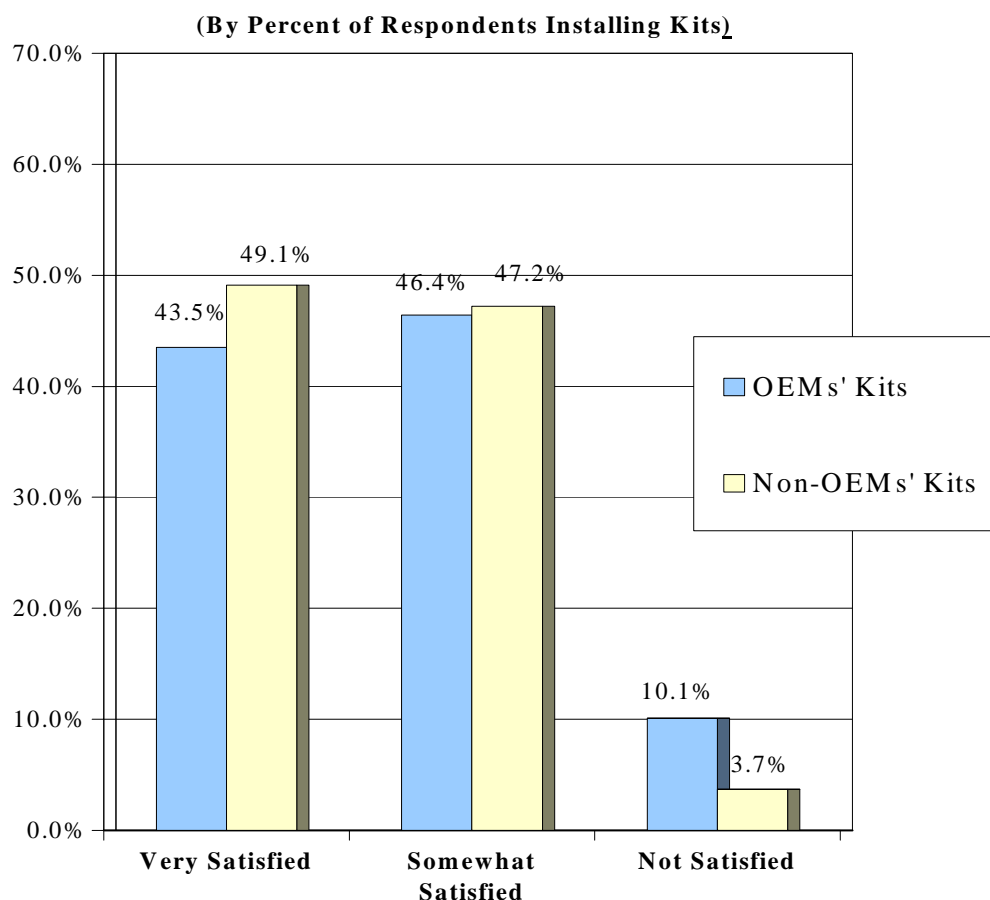
Source: PMMI

Technical Assistance

Of the three parameters by which end-users were asked to assess retrofit kits, clearly “technical assistance” was the most controversial. As Figure 19 illustrates, only 43.5 percent and 49.1 percent of the respondents, respectively, were *very* satisfied with the technical assistance from the OEMs and non-OEMs. While the majority expressed

FIGURE 19

**DEGREE OF END-USERS' SATISFACTION WITH
TECHNICAL ASSISTANCE FOR KITS
OEMS VERSUS NON-OEMS**



Source: PMMI

restrained satisfaction with the assistance they received, more respondents commented on this issue than on any other. In fact, it is worth noting that deficiencies in

“They provided us with incomplete information, which made the retrofit very difficult.”
User of OEM retrofit kit

“We received a lack of initial information and the time of response to our information requests was too long.” User of OEM retrofit kit

documentation and technical support from the manufacturers were cited not only with respect to retrofit kits, but in connection with machinery and repair parts issues in general.

“The promises they gave us on help weren’t met. We received help only at a high cost.” User of non-OEM kit

“The documentation they provided us with was really sparse. They must have thought we are mind readers” User of non-OEM kit

The Parts Ordering Process

The research addressed several issues dealing specifically with the process of ordering parts and repair/rebuilding services for packaging machinery, and it was especially geared toward uncovering any significant trends that may influence the direction of the parts and service markets in the future. The following discussion covers these findings.

Influence in the Selection of Parts Suppliers for Packaging Machinery

While the influence exerted by departments and/or individuals in decisions involving selection of parts suppliers tends to vary from one plant to another – often as a function of plant size – the findings nonetheless revealed certain patterns worth noting. Respondents were asked:

“Which department at your plant has the most say in the selection of which packaging machinery parts suppliers you use?”

As Table 10 indicates, 54.6 percent of the respondents identified maintenance as having the most influence, followed by engineering (23.4%) and then by upper management (8.3%), the latter reported principally by respondents of smaller firms. While one might rightly wonder about the relatively low percentage-mention of purchasing in the tabulation, since that department generally *places* the actual purchase orders for all parts and equipment, there is an explanation. The question posed to respondents asked which department has *the most say* in these decisions. Inasmuch as maintenance and engineering are charged with

keeping the plant running and rely heavily on their suppliers to ensure that their machinery remains operational, they have a major stake in selecting which suppliers are used. It is no doubt, however, that purchasing exerts some degree of influence, especially involving the issue of price.

TABLE 10
RELATIVE INFLUENCE IN SELECTION OF PARTS SUPPLIERS AND SOURCE
OF PARTS
BY PLANT DEPARTMENT

(Percent of Sample)

<u>Department</u>	<u>Has Most Say in General Selection of Packaging Machinery Parts Suppliers</u> (%)	<u>Has Most Say in Decisions on Whether to Use Non-OEM Parts</u> (%)
Maintenance	54.6	61.8
Engineering	23.4	21.7
Production	6.8	6.2
Upper Management	8.3	4.6
Purchasing	5.9	3.7
Corporate/Other	1.0	2.0
TOTAL	100.0	100.0

Source: PMMI

As a follow-up question, respondents were also asked:

“Which department at your plant has the most say in decisions on whether to order non-OEM (replicated) parts rather than OEM parts?”

As the Table 10 indicates, most of the departments maintain the same relative positions of influence with regard to the use of non-OEM parts, but with percentages for maintenance and production both up.

The Use of Blanket Orders for Parts

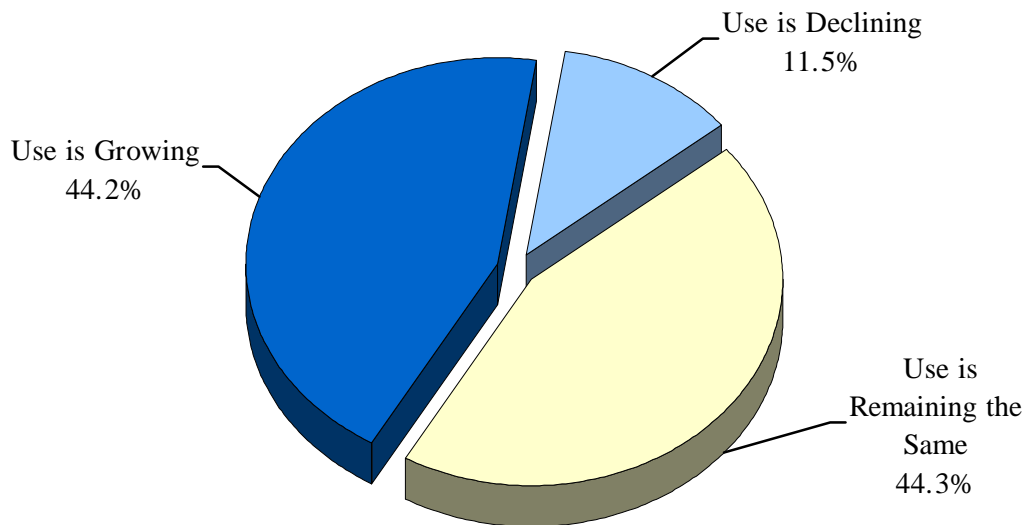
Based on a projection of the sample’s data, 17.3 percent of U.S. companies/plants order packaging machinery parts through some sort of blanket order arrangement. And of those,

blanket orders accounted for an average of 25.2 percent of their annual expenditures for packaging machinery parts. The vast majority (78.4%) of the companies reporting use of blanket orders are comparatively large with 16 or more packaging machines in operation. Conversely, only 21.6 percent of those with 15 machines or less indicated the use of blanket orders. Perhaps the most interesting finding, however, is that a large proportion of the companies using blanket orders (44.2%) see its use is growing on an annual basis (Figure 20).

FIGURE 20

TREND REGARDING USE OF BLANKET ORDERS

(By Percent of Those Who Reported Using Blanket Orders)



Source: PMMI

Why the Use of Blanket Orders is Growing For Some End-Users

Respondents who indicated that their use of blanket orders is growing on an annual basis were asked as a follow-up question to explain why. While the responses varied in specifics, the general theme that emerged was that blanket orders promote greater purchasing efficiency, reduce order handling time, offer greater convenience, and produce cost savings through the blanket order negotiations. Several companies have expanded their blanket order programs as a means of reducing their supplier base, while others are doing so in conformance with corporate directives.

The Use of EDI to Order Parts for Packaging Machinery

Only 10.5 percent of the sample's respondents reported that their company/plant orders parts for packaging machinery via an EDI (Electronic Data Interchange) system. Of those, 15.2 percent indicated that they *require* suppliers to use their EDI in processing parts orders. By the same token, 54.4 percent of the respondents (of those using EDI) felt it is important that suppliers be capable of working with their EDI system, but not required, i.e., it nevertheless would be a plus. And 33.3 percent indicated that it would be *helpful, but not necessary*. Similar to the earlier findings regarding use of blanket orders, the use of EDI is concentrated primarily among the larger plants and companies, with 77.3 percent of the sample's EDI users reporting 16 or more packaging machines in operation, and conversely only 22.7 percent having less than 16 machines operating.

The Use of Suppliers' Internet Web Sites to Place Parts Orders

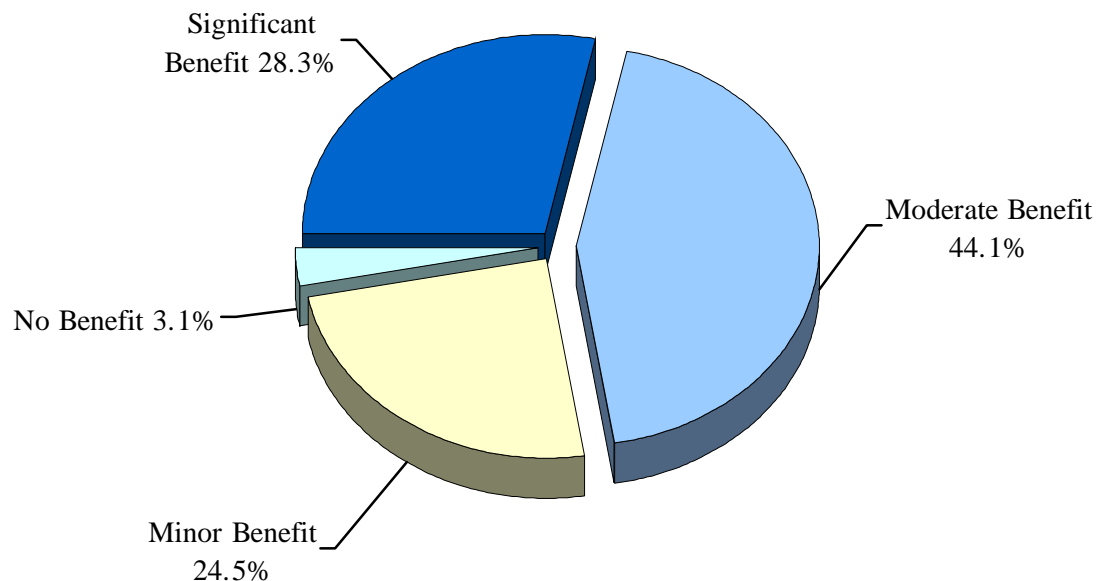
Over half the sample's respondents (51.0%) currently order some portion of their needed packaging machinery parts on suppliers' Internet web sites. From follow-up probing, however, it was learned that the web sites are used by a *larger* proportion of parts customers than the data suggest. While the 51 percent number refers to customers that actually *place orders* on the web sites, many of the remaining 49 percent suggested that they occasionally use the web sites to research parts prices and parts alternatives. In fact, certain of the respondents commented that the web sites are useful to them only if they know exactly what they are looking for. Otherwise, they prefer to place the order with a "live person" who can walk them through the process. As a further follow-up to assess the

benefit of being able to order parts via the Internet, respondents were asked specifically that question. *“How much of a benefit to you is the option of ordering packaging machinery parts on the Internet?”* The results, which appear graphically in Figure 21, reveal that 28.3 percent of those currently ordering on the Internet consider the benefit “significant”, while a 44.1 percent plurality assess it as a “moderate” benefit. Despite the somewhat lackluster numbers, it is evident that the need to make the option available will no doubt increase progressively with time.

FIGURE 21

**THE SAMPLE'S ASSESSMENT OF BENEFIT DERIVED
FROM ABILITY TO ORDER PARTS ON SUPPLERS'
WEB SITES**

(By Percent of Those Who Order Parts on Web Sites)



Source: PMMI

Parts Inventory Policies, Programs, and Trends

In light of the importance that end-users place on parts availability as one of their primary concerns, respondents were asked a series of questions dealing with the extent of parts inventory they currently maintain, the types of parts stocking programs that suppliers have been offering, and the steps, if any, they may be taking to ensure that parts are more readily available for their needs.

Parts Inventories Maintained by End-Users

Respondents were asked to estimate the approximate size of the parts inventory they maintain in-house for their existing packaging machines as an approximate percent of their total annual expenditures for packaging machinery parts. Of the total sample, only 2.4 percent reported that they do not maintain any inventory of parts in house, and thus rely entirely on their suppliers for their requirements. And as for the 97.6 percent that maintain a parts inventory, the average amount was 29.9 percent of their annual \$ usage of parts, which underscores the degree of dependence that end-users place on their suppliers' inventories.

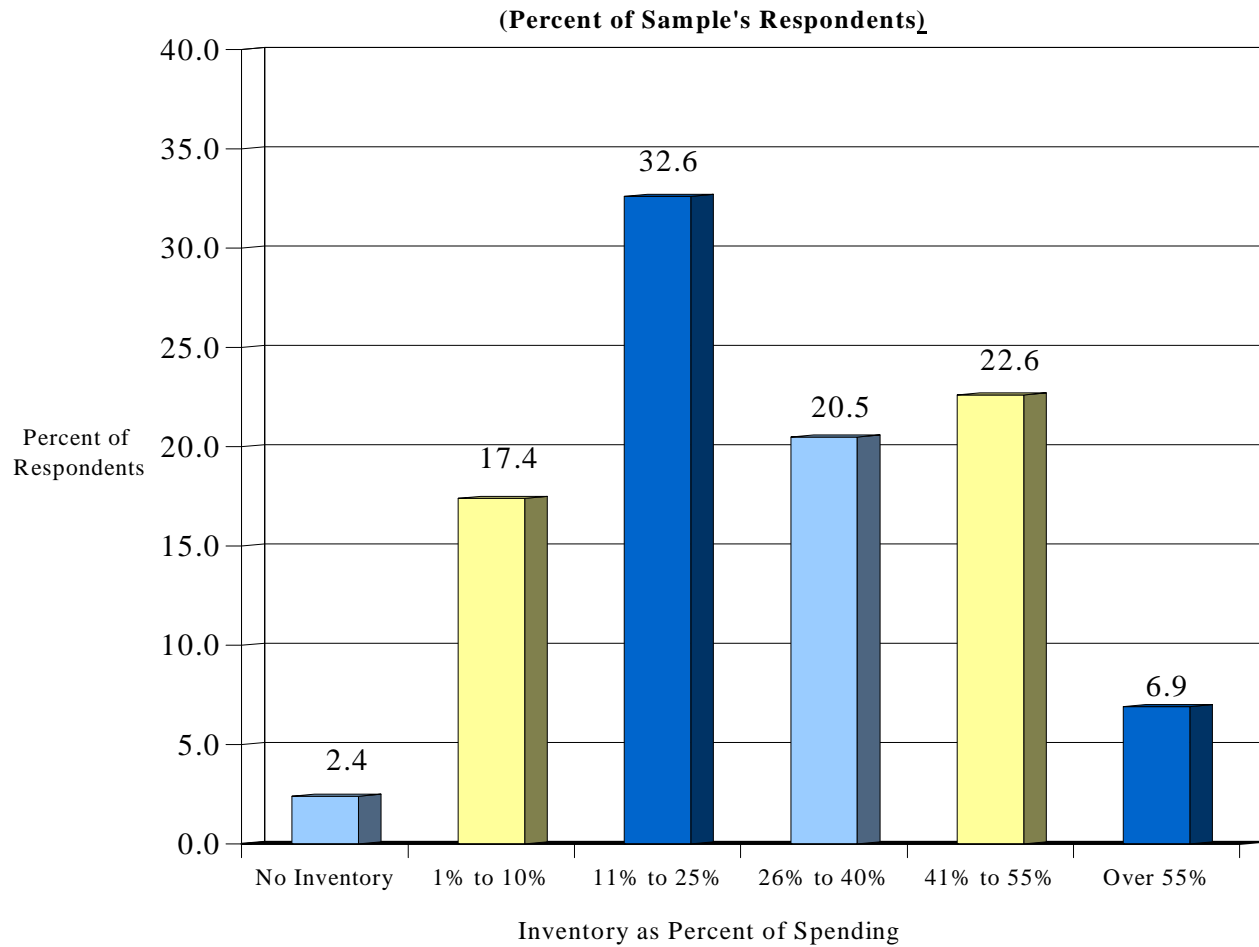
As Figure 22 indicates, nearly a third of the respondents – the largest single group – maintain an inventory equivalent to roughly 11-25 percent of their annual usage. With respect to the averages, it is important to emphasize that the amount of parts a company or plant typically keeps in inventory varies widely according to the kinds of packaging machines in operation, the numbers of different products packaged per line that require change parts, the age of the machines, the number of operating shifts, and the severity of the service, among other variables.

Kinds of Parts Maintained by End-Users in Their Inventories

Table 11 provides a breakdown of the kinds of parts that end-users keep in inventory during the year. As would be expected, the largest proportion of respondents (87.4%) reported that they keep essential wear parts on hand, since the need for replacing them is often difficult to predict. Preventative maintenance parts were mentioned by 77.1 percent of the total, followed by parts hard to obtain quickly (69.4%), such as components from obsolete machinery, and then by change parts (58.4%).

FIGURE 22

**END-USERS' INVENTORIES OF PACKAGING MACHINERY PARTS EXPRESSED
AS A PERCENT OF THEIR
ANNUAL PARTS \$ USAGE**



Source: PMMI

TABLE 11

KINDS OF PARTS END-USERS TYPICALLY MAINTAIN IN INVENTORY

(By Percent of Respondents Maintaining a Parts Inventory)

<u>Parts Maintained in Inventory</u>	<u>Percent of Respondents</u> (%)
Essential Wear Parts	87.4
Preventative Maintenance Parts	77.1
Parts Normally Difficult to Obtain Quickly (e.g. obsolete parts)	69.4
Essential Change Parts	58.4

Source: PMMI

Suppliers' Parts Inventory Programs

In an effort to gain or retain the parts business of certain lucrative parts customer accounts, many packaging machinery manufacturers and other suppliers of parts have established parts inventory programs designed to benefit the end-user. While they tend to vary in structure among suppliers offering the programs, they nonetheless conform in most ways to either of the following: (1) Guaranteed inventory maintained at the supplier's location and (2) Consignment of inventory to the customer at the customer's plant.

Guaranteed Inventory

The most common program offered by suppliers is the promise or guarantee—made either formally by contract or informally by handshake—that the supplier will always have certain designated parts on hand specifically for that customer. According to the findings, over a quarter of the sample's companies or plants (25.2%) benefit from this type of arrangement with at least one or more of their suppliers. In return for the supplier's commitment, customers are expected to buy the designated parts from that supplier exclusively. As Table 12 indicates, the vast majority of the guaranteed inventory arrangements (55%) operate with no formal obligation of the customer to that supplier;

TABLE 12
CUSTOMERS' OBLIGATION TO PARTS SUPPLIERS OFFERING
GUARANTEE OF PARTS INVENTORY FOR THEM
(By Percent of Respondents Reporting Guarantee)

<u>Obligation</u>	<u>Percent of Respondents</u> (%)
No Obligation Required	55.0
Must Purchase Only from that Supplier	23.5
Must Purchase a Prescribed Number of Parts in a Prescribed Time	21.5
Other	10.0

Exceeds 100.0% because of multiple answers.

Source: PMMI

however, where both supplier and customer acknowledge the arrangement, the customer generally feels an *unwritten* obligation to deal exclusively with that supplier in purchasing parts for the brand(s) of machines designated in the agreement. By the same token, 23.5 percent reported that their agreement formally requires that they order parts for the designated machine brand(s) exclusively from that supplier. And going a step further, 21.5 percent indicated that their agreement requires them to purchase a prescribed number of parts within a certain time period – generally based on historical usage patterns. It is worth noting, however, that follow-up probing of the responses – particularly those involving structured obligatory agreements – revealed that the interpretation and monitoring of the agreements are generally subject to some latitude within reason. But the findings also drove home the point that customers who commit to the agreements are generally intent on adhering to them and are receptive to the suppliers' overtures.

Consignment of Parts Inventory to the Customer's Plant

A smaller number of respondents (13.4%) reported that suppliers have consigned certain replacement parts to them at their physical plants for ultimate installation in the packaging machinery operating in their plants. Not surprisingly, many of the respondents who reported *not* having parts consigned to them expressed considerable interest in pursuing such a plan with any suppliers willing to offer it. In contrast to the guarantee arrangements, which are somewhat loosely structured, consignment plans are considerably more stringent in the terms of obligation and follow-up. As Table 13 indicates, the obligations of customers vary in specifics, with no single stipulation standing out above all others. (Please note that many respondents indicated more than one obligation as part of their agreement.) Nevertheless, the largest proportion of respondents (34.2%) reported that their agreement required them to pay current prices for the parts – reflecting the factor of time on the cost of the part to the supplier. And 31.7 percent indicated that they must use the parts within a prescribed period. In reality, it is likely that the number of the sample's companies under that obligation is higher than 31.7 percent considering that without a stipulated time frame a customer could conceivably hold on to the parts indefinitely. Similar to the guarantee arrangements discussed earlier, many of

TABLE 13
CUSTOMERS' OBLIGATIONS TO PARTS SUPPLIERS
CONSIGNING PARTS TO THEM
(By Percent of Respondents Reporting Consignment)

<u>Obligation</u>	<u>Percent of Respondents (%)</u>
Must Pay Current Prices for the Parts	34.2
Must Use the Parts within a Prescribed Time Period	31.7
Must Order All Parts for Designated Machines <u>Only</u> from That Supplier	19.5
Must Purchase a Prescribed Annual Dollar Value of Parts	17.1
Other	7.1

NOTE: Percentages exceed 100.0% because respondents gave multiple answers

Source: PMMI

the customers must agree to buy all their parts for designated machines from the supplier and must purchase a prescribed dollar amount of the parts on consignment. While admittedly expensive for the suppliers, the parts consignment plans appear to offer the best guarantee of ensuring total customer loyalty for their parts business.

End-Users Move to Cut Spending for Packaging Machinery Parts and Reduce Inventories

As part of the widespread efforts among end-users to reduce operating costs and improve plant efficiencies, maintenance and operating expenditures associated with packaging machinery have clearly been targeted. According to the findings, 54.4 percent of the sample's maintenance and engineering personnel have actually received directives from upper management to cut costs in specifically that area. While the 45.6 percent balance of respondents indicated not having received *specific* directives to reduce costs for packaging machinery parts and maintenance, anecdotal evidence revealed that they remained focused on cutting costs, nonetheless. In terms of specifics, 30.9 percent of the total sample reported having received a directive to reduce the amount of money spent annually for packaging machinery parts (presumably among other categories of machinery as well), and 39.1 percent indicated receiving a specific directive to reduce the size of the parts inventory they maintain for packaging machinery.

How End-Users are Implementing the Directives

Table 14 lists the various steps that end-users are taking to cut costs and reduce inventory size. While certain of the steps apply more to one of the directives than the other (cutting costs versus reducing parts inventories), all of the steps in combination satisfy both in some way. The largest proportion (54.9%) of those implementing directives reported **having parts made quickly by local machine shops.** In doing so they eliminate the need for inventorying certain of those parts and often obtain the parts at lower prices than the manufacturers charge. The most widely adopted cumulative step reported by the sample, however, is to shift the responsibility for inventorying parts away from their own facilities

and onto various parts suppliers. As the table shows:

Shifting Inventory Responsibility

39.4 percent are now relying more on packaging machinery manufacturers' inventories.

31.7 percent are relying more on non-OEM parts suppliers' inventories.

24.6 percent are relying more on general and specialty supply houses' inventories.

23.9 percent are relying more on machinery distributors' inventories

24.6 percent are sharing parts inventories with other facilities

TABLE 14

STEPS TAKEN BY THE SAMPLE'S COMPANIES TO REDUCE COSTS
RELATED TO PACKAGING MACHINERY PARTS
(By Percent of Those Required by Management to Reduce Costs)

<u>Steps Taken</u>	<u>Percent of Respondents</u> (%)
Having Parts Made by Local Machine Shops	54.9
Instituted or Upgraded Preventative Maintenance Program	48.6
Have Instituted a Better Inventory Control System	47.9
Relying More on Machinery Manufacturers' Parts Inventories	39.4
Relying More on Non-OEM Parts Replicators Inventories	31.7
Going Out to More Parts Suppliers for Quotes	30.3
Relying More on General and Specialty Supply Houses' Inventories	24.6
Relying More on Machinery Distributors' Parts Inventories	23.9
Sharing Parts Inventories with Other Facilities	24.6

NOTE: Percentages exceed 100.0% because respondents gave multiple answers

Source: PMMI

Other important steps taken include the institution of a better inventory control system (47.9%) and going out to more parts suppliers for parts quotations (30.3%). With regard to the percentages, it is important to emphasize that most respondents indicated that more than one step has been implemented by their respective plant(s).

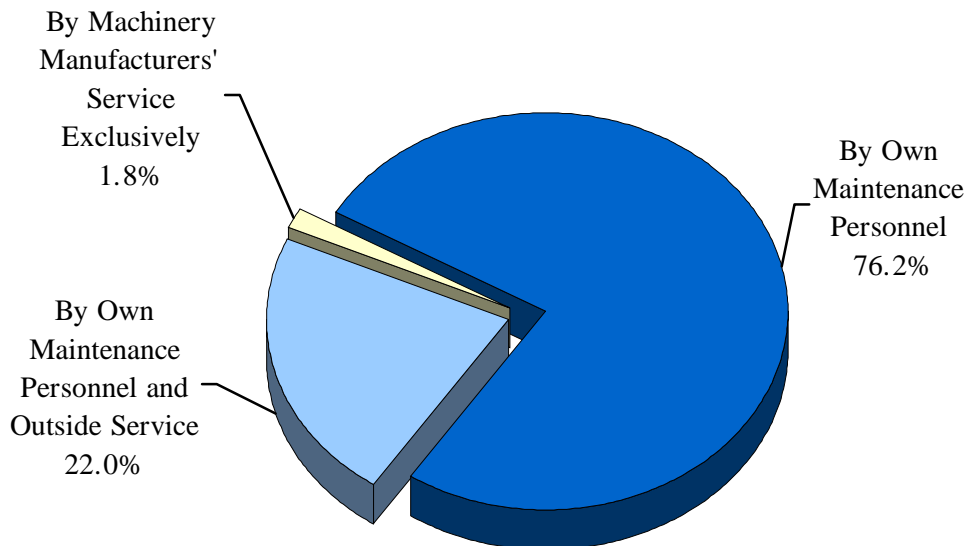
Preventative Maintenance

Of all the steps taken by the sample's companies to reduce costs, perhaps the most prolific has been the establishment or upgrading of preventative maintenance programs. As Table 14 indicates, 48.6 percent of those required by directive to cut costs cited preventative maintenance as a key initiative. But that 48.6 percent was based on the 54.4 percent of the sample told to reduce costs, which in effect represented 26.4 percent of the entire sample ($54.4\% \times 48.6\% = 26.4\%$). On the other hand, 59.6 percent of the entire sample's companies currently have a preventative maintenance program of one sort or another in effect.

FIGURE 23

HOW PREVENTATIVE MAINTENANCE PROGRAMS ARE CARRIED OUT

(By Percent of Those Who Currently Have Program in Force)



Source: PMMI

The significance of preventative maintenance as a cost-cutting initiative is that end-users typically look to the machinery manufacturers for guidance on maintenance procedures for their machinery. As a result, technical information and procedural guidance from the manufacturers, when provided in a constructive, cooperative manner, usually give the manufacturer a “leg up” in maintaining end-users’ parts and service business. As Figure 23 indicates, the vast majority of end-users (76.2%) perform preventative maintenance on their existing packaging machines with their own maintenance personnel, while 22 percent use a combination of their own crews and outside service.

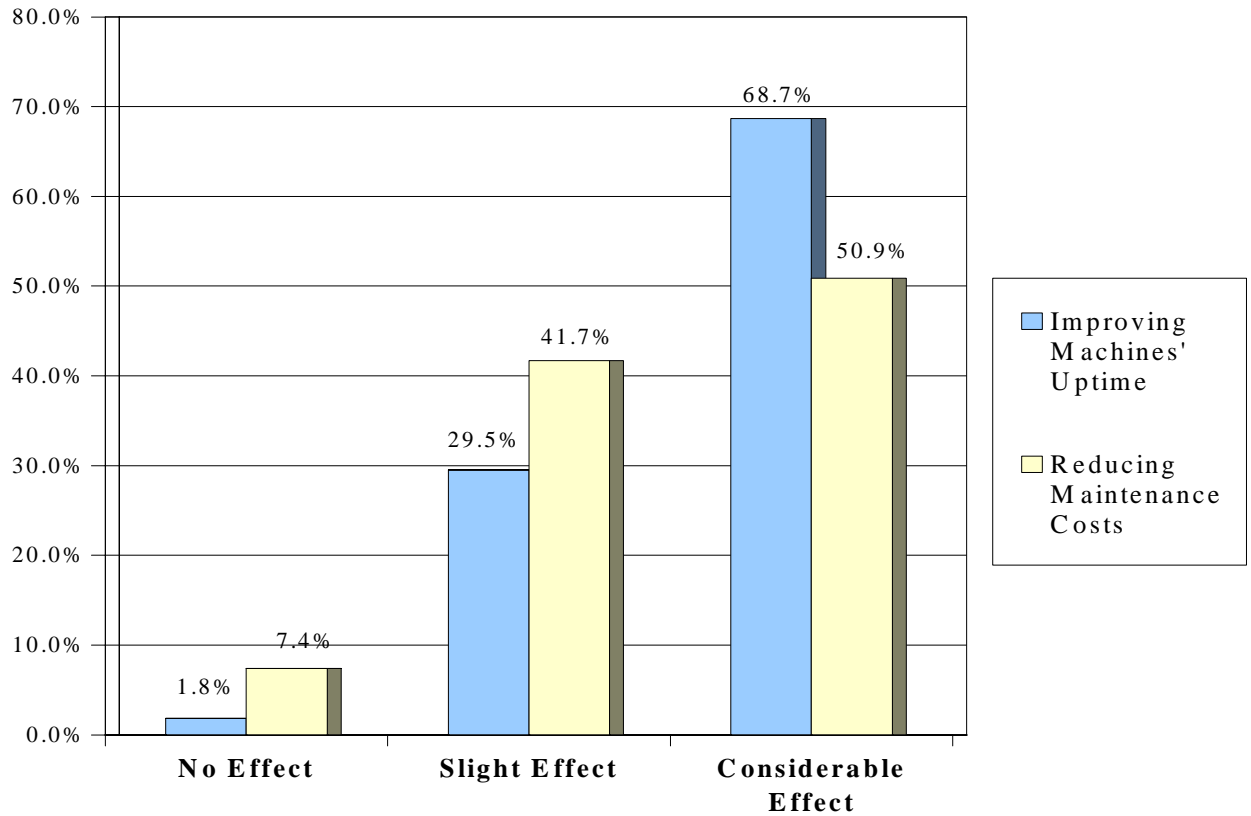
The Effects of Preventative Maintenance Programs as Assessed by End-Users

In order to gauge the impact that preventative maintenance programs have had on end-users’ efforts to reduce costs and improve machinery uptime, respondents were asked directly to assess the results of their programs based on those two factors. As illustrated by the bar chart of Figure 24, respondents reported overwhelmingly (68.7%) that their respective programs having had a considerably positive effect on improving machinery uptime. And 50.9 percent indicated that the programs also have had a considerably positive effect on reducing machinery maintenance costs. Of the remaining respondents, most reported only a slight improvement in machinery uptime and only a slight reduction in maintenance costs. The findings suggest, therefore, that the preventative maintenance concept offers exceptional opportunities for machinery manufacturers to make inroads with existing customers by providing valuable guidance in maintenance procedures.

FIGURE 24

**THE SAMPLE'S ASSESSMENT OF THE EFFECTS THAT
PREVENTATIVE MAINTENANCE PROGRAMS HAVE HAD ON
THEIR PACKAGING MACHINERY OPERATIONS**

(By Percent of Respondents With PM Programs in Force)



Source: PMMI

How Customers Rate Packaging Machinery Manufacturers' Services

As a means of gauging customers' degrees of satisfaction and/or dissatisfaction with the machinery industry's services, the sample's respondents were asked to evaluate – based on their perceptions – how they believe packaging machinery manufacturers perform according to various factors dealing with parts and service. Their evaluation was to be measured on a rating scale of 1 to 10, where 10 represents excellent and 1 represents terrible. In addition, respondents were asked to apply their ratings separately to North American packaging machinery manufacturers and Non-North American packaging machinery manufacturers, and wherever possible to provide supporting comments about their ratings. While the resulting

data presented in Table 15 vary by each factor, two obvious conclusions may nevertheless be drawn:

- (1) North American packaging machinery manufacturers are viewed more favorably than Non-North American manufacturers in regard to all of the factors.
- (2) Many customers see the need for significant improvement in the services provided by both.

Taking all factors into consideration, the North American manufacturers received an average rating of 6.9, which is equivalent to the subjective assessment of between “OK” and “Good” (please see scale above Table 15); whereas the Non-North American manufacturers were rated 5.6 on average, equivalent to just “OK”. Further insight into the rating scores and how the averages evolved can be obtained through an analysis of the second and third columns of Table 15, which list respectively, the percent of respondents rating the manufacturers a high score of 8, 9, or 10 and the percent rating them a low score of 1, 2, or 3. As shown, a considerably larger percent of respondents consistently rated the North American manufacturers 8, 9, or 10 compared with the Non-North American manufacturers. Moreover, a larger proportion rated the Non-North American manufacturers 1 to 3 than they did the North American manufacturers.

North American Manufacturers’ Ratings and Related Comments

The North American machinery manufacturers’ score averages ranged from a low of 5.7 to a high of 7.7 out of a possible 10.0. They fared best in the areas of “parts quality” (7.7); “ease of doing business with” (7.6); “timely courteous, response to parts inquiries” (7.5); “having parts available when needed” (7.4); and “technical assistance” (7.4). They received their lowest ratings for “obsolete parts service” (5.7); “reasonable parts prices” (5.7); and “order-status follow-up” (6.4).

TABLE 15
THE SAMPLE'S ASSESSMENTS OF NORTH AMERICAN AND NON-NORTH
AMERICAN PACKAGING MACHINERY MANUFACTURERS' PERFORMANCE
REGARDING PARTS AND REPAIR SERVICES
(Based on a Rating Scale of 1 – 10)

<div> <div>Terrible</div> <div>Fair</div> <div>OK</div> <div>Good</div> <div>Excellent</div> </div> <div> 1.....2.....3.....4.....5.....6.....7.....8.....9.....10 </div>						
Factor	Average Rating		Percent Rated 8-10		Percent Rated 1-3	
	North American (1 to 10)	Non-North American (1 to 10)	North American (%)	Non-North American (%)	North American (%)	Non-North American (%)
Having Parts Available When Needed	7.4	5.4	59.8	21.6	1.4	24.2
Timely, Courteous Response to Inquiries	7.5	6.0	58.6	33.6	1.4	16.4
Consistency of Parts Quality	7.7	7.4	65.0	64.6	0.7	4.9
Order-Status Follow-Up	6.4	5.3	33.6	18.5	9.3	20.3
Meeting Delivery Commitments	7.0	5.8	50.5	26.0	2.9	15.0
Service on Obsolete Parts	5.7	4.5	19.0	10.3	11.2	36.0
Ease of Doing Business With Supplier	7.6	5.6	61.1	28.2	2.1	22.0
Reasonable Pricing on Parts	5.7	4.5	21.4	9.7	17.5	35.0
Technical Assistance	7.4	6.0	54.6	32.2	1.8	16.3
Repair/Rebuilding Services	6.7	5.2	40.6	18.3	4.2	22.6
Sales Representative Coverage and Assistance	6.7	5.3	41.3	21.7	8.1	24.4
Documentation	6.9	6.0	42.7	30.9	10.6	17.5

Source: PMMI

The following comments are representative of those received. Typically respondents vented frustration when giving manufacturers a poor rating, but rarely shared positive comments when rating them favorably; thus, the majority of comments that appear below are negative.

Comments Supporting Ratings of North American Machinery Manufacturers

Parts Availability/Delivery

“Some North American machinery manufacturers we deal with really care about getting parts to us quickly, but many others just couldn’t care less.”

“They don’t seem to have the parts inventories to support their business. Maybe it’s because they have to stock so many parts since the machines become obsolete in no time.”

Order Status Follow-Up

“I have yet to receive a simple follow-up call on any parts order I’ve placed”

“Nobody follows up. We need to call them constantly. Can’t understand how they expect to stay in business that way.”

Obsolete Parts Service

“We get no help from OEMs on obsolete parts. Parts become obsolete quickly and then we often have to rely on local machine shops to remanufacture them.”

“Sometimes we have to wait months to get a part for our obsolete machine.”

“For older equipment they try to sell us a new machine instead of getting us the parts.”

“Technology is advancing quickly and parts that come off the shelf are obsolete in 1 to 1 ½ years. From then on, you have to go through a local machine shop.”

Ease of Doing Business With

“U.S. manufacturers are easier to contact when you need immediate help. We’ve had communication issues with European companies because of time zone problems”.

“Some of the people on the order desk act like they’re doing us a favor when they take our parts order.”

Reasonable Pricing on Parts

“Proprietary parts are way too expensive.”

“Parts are a massive expense, but local machine shops are much cheaper than OEMs.”

“We know what it costs to make things, and they’re just exorbitant with their prices; they gouge us.”

Technical Assistance

“We can go to websites and get technical assistance immediately.”

“There never seems to be enough technical support or they are in the wrong place to be able to assist quickly.”

“Companies are downsizing their tech service and there are not enough technicians available.”

“It’s too expensive for small businesses because they charge us for hotel, airfare, and restaurants. The bill is huge before they even begin working.”

Sales Rep. Coverage and Assistance

“They haven’t contacted us in 2 years. He should stop by once in awhile and treat me as if I’m somebody. Because I don’t have a bunch of machines they don’t bother coming in.”

“Sales reps normally only show when they want to sell a machine, not when we need help.”

Documentation

“A lot of machinery manuals seem to be written by people who never worked on their machines.”

“The drawings and manuals from U.S. manufacturers are better than those from overseas because things are often lost in translation from foreign manufacturers.”

“U.S. manufacturers have terrible documentation.”

“North American companies have to improve standard parts manuals, trouble-shooting techniques, and drawings – 3D”

Non-North American Manufacturers

The Non-North American machinery manufacturers' average ratings ranged from a low of 4.5 to a high of 7.4. They fared best in the areas of "parts quality" (7.4); "technical assistance" (6.0); "timely courteous, response to parts inquiries" (6.0); and "documentation" (6.0). They received their lowest ratings for "obsolete parts service" (4.5); "reasonable parts prices" (4.5); "repair/rebuilding services" (5.2); and "sales representatives' coverage and assistance" (5.3). It is worth noting that the highest scores for the Non-North American manufacturers were generally surpassed by those given to the North American manufacturers, and the lowest Non-North American scores were below those given to the North American manufacturers. While nearly an equal number of comments were offered in support of ratings for both North American and Non-North American manufacturers, the comments accompanying the Non-North American ratings, as will be seen, were decidedly more emphatic in reflecting displeasure.

Comments Supporting Ratings of Non-North American Machinery Manufacturers

Parts Availability

"It sometimes takes weeks to get a part from Non-North American suppliers and the orders are often screwed up."

"Outside the U.S. is nothing but trouble. Germany, France, Italy ... bad attitude on delivery."

"Foreign suppliers don't stock enough parts. Sometimes it takes months to receive a simple item."

"They're too far away and their local reps can't help."

Timely, Courteous Response to Inquiries

"European companies are mostly very unresponsive; too many vacations, bankers' hours."

"Language barriers and time zones are a real problem in dealing with them."

"They don't understand us and we don't understand them. They're polite though."

"Time zone problems with ordering from overseas. It's difficult to get in touch with them."

Order Status Follow-up

“Non-North American suppliers never get back to you.”

“The foreign manufacturers take forever to confirm a delivery or status.”

Meeting Delivery Commitments

“They rarely meet the dates they promise, but it might be shipping problems overseas.”

“Non-North American manufacturers still struggle to make commitments.”

“Sometimes they’ll tell us two weeks and we’ll get it in two months.”

Obsolete Parts Service

“We rely on local machine shops for obsolete Non-North American parts. It’s too much of a hassle otherwise.”

“Obsolete parts are a problem from both U.S. and foreign, but because of the time zone and language barriers, it’s often worse from the foreigners.”

Ease of Doing Business With

“Communication and follow-up are difficult outside the U.S.”

“They have an attitude that they know more than us”

“Ordering from Europe is a pain in the posterior.”

“Non-North Americans are harder to reach, language barriers, reps unavailable in U.S.”

“It’s inconvenient because of the time zones and language differences.”

“Communication issues. They don’t understand US manufacturing.”

Reasonable Pricing on Parts

“Non-North American machines are inexpensive, but they gouge us on parts.”

“Prices are very high from overseas by comparison with here.”

“We get some Non-North American machine parts made for us locally. They’re much cheaper.”

Technical Assistance

“We can’t understand them. They have different specs, wiring, codes, etc.”

“We have a problem understanding each other, so technical help is a problem.”

“The Non-North American engineering is better, but getting assistance is a pain.”

Repair/Rebuilding Services

“Non-North American companies do it well, but never on time.”

“Time lag is an issue in all aspects of purchasing Non-North American machinery, including service.”

Documentation

“Most of the documentation we get is not understandable.”

“Non-North American documentation is not as good because stuff is lost in the translation.”

“German documentation is far better than from U.S.”

“Some Non-North American companies don’t offer manuals in English.”

More Parts Business Potentially Available to Machinery Manufacturers

In light of the fact that North American packaging machinery manufacturers are currently losing roughly 40 percent of their prospective parts business to other sources of supply – a basic finding of this research – it was deemed appropriate to examine how manufacturers could conceivably capture at least a portion of that business. Therefore, taking into account the findings relating to customers’ priorities, their reasons for buying parts from alternative suppliers other than the machinery manufacturers and their distributors, as well their assessments of the services currently provided by the manufacturers, the study addressed the issue in terms of specific changes and improvements that could potentially offer positive results.

Overview – Basic Improvements Needed in Customer Service

Throughout much of the research, respondents' comments revealed an underlying common thread pointing to the need for an improvement in the caliber of customer service currently provided by the machinery manufacturers. While the attitude was not universally held among the sample's respondents – for some were vocally pleased with the services they receive from the manufacturers – the number identifying flaws was nevertheless significant. Many cited numerous instances of **inattentive parts service**, contrasted with the kind of attention devoted to landing new machine orders. Several alluded to the **slow response** they receive to requests for parts quotations, technical information, confirmations, and updates on parts order status. And as obvious as it may appear, they claim too few people on the order desk offer a **simple thank you** for the business they receive. Many of the nuances associated with superior customer service obviously involve common sense, but for the most part, they are based on the idea of projecting a genuine attitude of efficiency, professionalism, appreciation of the customer's business, and a willingness to do whatever is necessary to ensure the customer's satisfaction – both at the time the machine order is placed and especially afterward. To a large extent, it requires a **proactive parts and service marketing effort emphasizing OEM quality and consistency – and especially reflecting the machinery manufacturer's interest in serving its aftermarket customers effectively**

Specific Options

As the central idea of the methodology examining options that could potentially provide machinery manufacturers with increased parts and service business, respondents were asked the question:

“Please indicate if any of the following steps (of improvement or innovation) would encourage you to increase the amount of parts you order from the machinery manufacturers (OEMS) rather than from other suppliers”.

And as shown in Table 16, they were given the choices of: “NO EFFECT”; “MAY have a positive effect”; “WOULD LIKELY have a positive effect”; and “WOULD DEFINITELY

have a positive effect”. The results, listed in the table, indicate the percent of the total sample’s respondents answering for each of the four possibilities.

TABLE 16

POTENTIAL POSITIVE EFFECTS THAT SPECIFIC IMPROVEMENTS OR INNOVATIONS IN SERVICES WOULD HAVE ON INCREASING THE AMOUNT OF PARTS BUSINESS END-USERS GIVE TO THE MACHINERY MANUFACTURERS

(Percent of Sample’s Respondents)

Proposed Improvement or Innovation in Service	Would Have <u>No Effect</u> (%)	<u>May</u> Have a Positive Effect (%)	Would <u>Likely</u> Have a Positive Effect (%)	Would <u>Definitely</u> Have a Positive Effect (%)
Provide Closer Tech Rep Contact	19.3	33.6	31.6	15.5
Speed Up Parts Deliveries, Shorter Lead Times	9.3	20.4	36.0	34.3
Offer Price Incentives on Orders for Common Parts	4.8	13.6	29.6	52.0
Offer price Incentives for Bundled Parts Packages	15.8	22.7	30.5	31.0
Provide Guarantee of Competitive Pricing	4.8	12.6	32.6	50.0
Provide More Technical Information	17.7	23.3	33.4	23.6
Offer Training on Maintenance Procedures	16.0	26.7	31.0	26.3
Offer Beneficial Parts Contract	25.3	34.9	27.6	12.2
Offer Inventory Consignment	34.8	29.4	18.3	17.5
Provide 24 Hour ‘Round the Clock Service	13.7	24.4	26.7	35.2
Provide Better Documentation	21.9	24.9	29.8	23.4
Provide Direct Sales Rather Than Through Distributors	22.7	25.5	26.5	25.3
Provide Parts Reorder Reminders	38.9	34.4	16.0	10.7
Offer Periodic Parts Consultations	26.5	38.2	25.2	10.1
Offer Advantageous Maintenance/Repair Agreement	29.3	34.7	24.7	11.3

Source: PMMI

Following that question, respondents were then asked:

“Ideally, how much of the parts business you currently give to other suppliers would you possibly give to the original packaging machinery manufacturers if they were to implement the improvements you indicated?”

Based on the results, manufacturers theoretically have the potential to **secure an average of 58.7 percent of the parts business they are currently losing to alternative suppliers.**

While the number is admittedly based on hypothetical conditions, it nevertheless confirms that end-users are open to the idea of working more closely with manufacturers on parts. Figure 25 reveals the distribution of responses by range of percent representing additional parts business they would consider giving to the manufacturers.

Better Pricing for Common/Commercial Parts

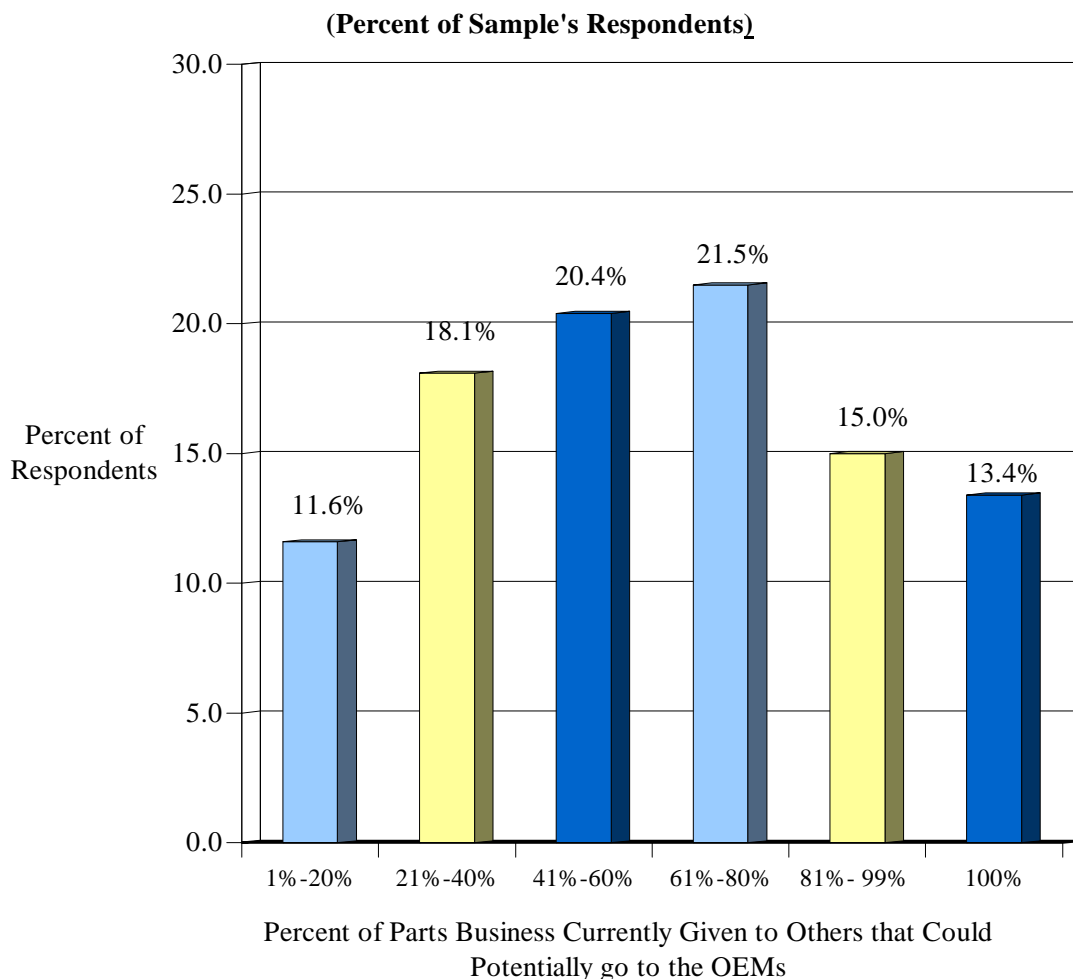
As indicated earlier, common or commercial parts account for nearly 52 percent of the market’s total expenditures for all packaging machinery parts, of which the packaging machinery manufacturers now capture less than 44 percent. While the prospect of consistently matching the prices charged by the common/commercial parts suppliers would appear unrealistic to say the least, the findings revealed that customers might be willing to pay a small premium to the machinery manufacturers for common parts to gain the benefit of consolidating parts purchases with fewer suppliers. Over the years, the machinery manufacturers have gained the reputation of gouging on common parts prices with mark-ups ranging as high as 700 percent. By *promoting* a more reasonable schedule of common parts pricing – perhaps gained from negotiations with the common parts manufacturers for improved OEM discounts on parts – the machinery manufacturers could tap into a segment of the market currently out of reach.

Guarantee of Competitive, Reasonable Pricing

As indicated above, many customers would actually prefer to buy all or most of the parts for their packaging machinery from packaging machinery suppliers for the benefit of convenience as long as the pricing is reasonable and competitive. While it might be nearly

FIGURE 25

**PERCENT OF PARTS BUSINESS CURRENTLY GIVEN TO
OTHER SUPPLIERS THAT MACHINERY MANUFACTURERS
COULD THEORETICALLY GAIN BY IMPLEMENTING
IMPROVEMENTS IN TABLE 16**



impossible to match the prices of some machine shops or replicators on proprietary parts, a guarantee of competitive or reasonable pricing on common parts can be a realistic option. As for the premium on proprietary parts, the promotion of genuine OEM quality along with a review of current pricing structures could potentially gain results. The following quotes support the findings:

“We’d love to buy from the machinery OEMs when we aren’t getting gouged by them.”

“If priced competitively, we would always go to the machinery OEMs because it’s easier and we have better peace of mind about quality.”

Faster Delivery of Parts

While clearly easier said than done, increasing the speed at which parts are delivered to the customer would no doubt yield the one of the more immediate results in generating more parts business to the manufacturers. By systematically surveying customers’ annual parts usage – a sales tool in itself – together with a concerted move to align parts inventories with expected market needs, manufacturers would not only get a better handle on which parts need to be stocked, but would also signal to the customer that an earnest effort is being made to improve deliveries.

Price Incentives for Bundled Parts Packages

As Table 16 indicates, nearly a third of the respondents would “definitely” look favorably at ordering bundled parts packages consisting of several essential parts offered together at a discounted price, and an additional 30 percent indicated that bundled parts packages would “likely” affect their buying decisions in a positive way. The research went no further than to identify the concept; however, bundled parts – if structured and marketed properly – have proven in many industrial markets to be an effective means of increasing business.

24 Hour ‘Round the Clock Service on Parts

While it takes merely an answering service and trusted on-call personnel designated to open the shop after hours (when called) to furnish a customer with a needed part, the ability of offering 24 hour ‘round the clock parts service can be a major marketing tool. Experience shows that the frequency of after-hour calls is very low, but the perceived value to customers is great, as confirmed by the following comment:

“We run three shifts per day and currently need to wait 2 ½ shifts for the manufacturer’s place to open again if something breaks. We’d love to have that kind of service.”

More Technical Information and Better Documentation

Many of the sample's respondents would like the machinery manufacturers to improve the documentation they provide for their machinery and also to offer more technical information as a matter of course. Their comments cited the need for more troubleshooting tips and more schematics in particular. As Table 16 indicates, improvements in both areas would have a positive effect on customers' inclinations to buy more parts from the manufacturers, though most likely on the condition that improvements are made in other areas as well.

"The manufacturers should improve initial documentation. There are not enough parts drawings. It's sometimes difficult to order parts because the drawings are unclear."

"If the machinery manufacturers offered more price breaks and technical assistance, they'd become a preferred vendor."

Closer Technical Representative Contact

The findings consistently revealed that end-users look anxiously to the machinery manufacturers for whatever technical assistance they can provide, especially in light of the rapid changes evolving in packaging machinery technology. While only 15.5 percent of the respondents indicated that closer rep contact would "*definitely*" have a positive effect on the amount of business they give to the OEMs and 31.6 percent said it would "*likely*" have an effect, the mere increased presence of technical reps offering genuine assistance on behalf of the end-users' interests can only foster a closer relationship between the manufacturer and customer.

"If the OEMs were able to evaluate operating conditions and be able to predict failures, that would really be a plus. More check ups from the reps – once a month."

Training on Maintenance Procedures

Consistent with the growing use of preventative maintenance programs by end-users throughout the market, plant personnel are eager for guidance from machinery manufacturers as how best to apply preventative maintenance to their particular packaging machines. As Table 16 indicates, 26.3 percent of the respondents indicated that such

training would “*definitely*” have a positive effect on the parts business they give to the manufacturers and 31 percent said it would “*likely*” have a positive effect. Irrespective of the table’s percentages in this regard, it appears obvious that maintenance training programs for end-users can not only generate good will with customers, but more importantly, they can allow the trainers to recommend parts replacements and schedules, which can in themselves, potentially increase parts business.

Direct Representation on Parts Sales

While end-users continue to value the services of distributors, over half the respondents said that direct parts sales through the machinery manufacturers would either likely or definitely cause them to buy more manufacturers’ parts as opposed to parts from alternative suppliers (Table 16). Some of the comments alluded to the belief that manufacturers are more knowledgeable about the machinery than distributors are and they generally have more parts in stock.

Manufacturing Methodologies

In recognition of the growing adaptation of manufacturing improvement methodologies by end-user organizations, it was deemed appropriate to examine the methodology issue as being one more element machinery manufacturers might need to consider in approaching the market more effectively. Respondents were asked to identify – from a list of eight – the specific manufacturing improvement methodology (ies) to which their respective plants adhere. As Table 17 indicates, all but 30.6 percent of the sample’s respondents (in effect, 69.4%) reported that their plant or company *does* adhere to one or more methodology. And of those, Lean Manufacturing was identified by 57.8 percent (Column 2 of Table 17), followed closely by Total Quality Management (55.9%), ISO (30.9%) and then Six Sigma (26.0%). Please note that several respondents identified more than one methodology in their answer.

As a follow-up, all respondents were then questioned as to how important it is to them whether or not a packaging machinery manufacturer adheres to one or more manufacturing

improvement methodology(ies). As Table 18 indicates, two thirds of the total sample assess some degree of importance to adherence by manufacturers; however, when

TABLE 17
MANUFACTURING IMPROVEMENT METHODOLOGIES
ADHERED TO BY THE SAMPLE
(Percent of Total Sample)

Manufacturing Improvement Methodology	Percent of <u>Total</u> Sample (%)	Percent of <u>Only</u> Those Identifying a Methodology (%)
Lean Manufacturing	40.1	57.8
Total Quality Management	39.1	55.9
ISO	21.8	30.9
Six Sigma	18.0	26.0
Theory of Constraints	4.1	5.9
Toyota Production System	4.1	5.9
Agile Manufacturing	2.4	3.4
Other	9.2	23.7
No Methodologies Adhered to	30.6	NA

NOTE: Percentages exceed 100.0 percent due to multiple answers

Source: PMMI

considering only those respondents whose companies currently *do* adhere to a methodology, the proportion giving that adherence some degree of importance rises to 75 percent. The increase, therefore, logically indicates that those adhering to a methodology generally see value in their suppliers doing so as well.

Finally, only the respondents who indicated that machinery manufacturers' adherence to a methodology is important were asked: "*Which methodology would you like the machinery manufacturers to follow?*" The results, which appear in Table 19, reveal that only 13.2 percent

would like machinery manufacturers to adhere to lean manufacturing, despite the fact that 57.8 percent currently follow that methodology themselves. By contrast, 37.9 percent indicated a preference for their suppliers to follow ISO, while a lesser 30.9 percent follow it themselves.

TABLE 18
SAMPLE'S ASSESSMENT OF HOW IMPORTANT IT IS WHETHER OR NOT A
PACKAGING MACHINERY MANUFACTURER ADHERES TO ONE OR MORE
MANUFACTURING IMPROVEMENT METHODOLOGIES
(Percent of Total Sample)

Degree of Importance	Percent of <u>Total</u> Sample (%)	Percent of <u>Only</u> Those Identifying a Methodology (%)
Extremely Important	12.4	16.2
Important	29.0	32.8
Slightly Important	24.5	26.0
Not Important at All	34.1	25.0
TOTAL	100.0	100.0

Source: PMMI

TABLE 19
WHICH MANUFACTURING IMPROVEMENT METHODOLOGIES
THE SAMPLE’S RESPONDENTS WOULD LIKE MACHINERY
MANUFACTURERS TO FOLLOW
(Percent of Those Considering Manufacturers’ Adherence Important)

Manufacturing Improvement Methodology	Percent of <u>Only</u> Those Considering Adherence by Manufacturers Important (%)
Lean Manufacturing	13.2
Total Quality Management	42.1
ISO	37.9
Six Sigma	25.4
Theory of Constraints	0.0
Toyota Production System	6.1
Agile Manufacturing	0.0
No Methodologies Adhered to	NA

NOTE: Percentages exceed 100.0 percent due to multiple answers

Source: PMMI

APPENDIX