

Survey



Comparative costs and uses of Data Integration Platforms

research and survey results

An original research survey paper by Bloor Research
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Philip Howard

Introduction

Data integration has sometimes been portrayed as a necessary evil, a cost centre, a time sink, or in other unflattering terms. Conversely, some vendors, consultants, pundits and analysts have positioned various integration models and technologies aggressively as a miracle cure-all. However, there is a surprising lack of primary research to support any kind of claim with regards to the cost of, or cost-effectiveness of, data integration solutions. Even basic details on how data integration platforms are being used in organisations today are thinly supported by today's research. Opinions are everywhere: facts are few and far between.

Bloor Research has set out to provide the marketplace with some of the most comprehensive information available as to the types of projects that data integration platforms are being used for, on what scale, and whether this differs by integration product. Our research was designed to capture detailed information on the costs involved with using different products, including both direct acquisition and recurring costs, ultimately arriving at a comparison by vendor of total cost of ownership (TCO) over a three year period. In addition, we wanted to go beyond traditional TCO formulations and estimate relative cost effectiveness based on costs per integration project and costs per source and target connection: which Bloor Research believes provide more useful and robust metrics for decision-making.

In order to gather the appropriate information to reach our conclusions Bloor Research conducted a survey, which produced 341 responses from companies using data integration tools (or, in some cases, using hand coding) for a variety of purposes. There is more useful content in these responses than we could analyse and include within this particular report (we hope to address that in subsequent reports) and, inevitably, there were also some responses that failed to provide complete or meaningful data. We decided to exclude the latter responses from our analysis and consequently the results of this survey are based on 163 completed responses.

One unfortunate consequence of this decision has been that we no longer have enough responses from users of either open source tools or hand coding, for us to fully rely on the responses received from these users. While we have included these results (in summary form only) in the details that follow, readers should be aware that the results from these two categories are not necessarily reliable and should be treated with caution.

This report does not attempt to distinguish between products on the basis of their functionality and, in any case, that type of information is readily available elsewhere (not least from Bloor Research). One product may be more suitable for supporting complex transformations than another, for example. Similarly, another product may offer better performance or have more real-time capabilities or have features that are not present elsewhere. Cost is, and should be, only one of several determining factors when selecting data integration solutions.

Our results certainly show dramatic, and sometimes surprising, differences between vendors and products in both overall TCO and in cost per project and cost per source and target system, as well as variations within the range of common integration scenarios or use cases. As we noted earlier, this type of primary research and the level of detail in this report are not generally attempted in the data integration field, but Bloor Research believes that this information will contribute to a better understanding of the options available to practitioners that are responsible for designing, planning and implementing data integration projects and strategies.

Using data integration platforms

In this section we review the data we collected about how the various products were used, the frequency with which they were used for common scenarios and our respondents' views on the suitability of these products for each scenario.

Integration scenarios

We started by outlining six common scenarios for which data integration tools might be used. In our experience, these scenarios or use cases represent the vast majority of project types for which integration products are used. The scenarios are:

1. Data conversion and migration projects
2. ETL, CDI and MDM solutions
3. Synchronisation of data between in-house applications (such as CRM/ERP)
4. Synchronisation of data with SaaS applications
5. B2B data exchange for, say, customer/supplier data
6. Implementation of SOA initiatives

Respondents were asked to identify the one, or more, integration products that were used in their organisation for these scenarios and to identify the single product with which they had the most experience. For that selected product, respondents recorded their view of how suitable they thought their tool was for each of the above scenarios. It was not a requirement that the chosen product or vendor was actually being used for each scenario, simply that respondents believed that the products were suitable.

In this and following charts we have distinguished between single-product vendors (Pervasive Software) and those supplying multiple products, because there is clearly an advantage in being able to tackle multiple project types with a single tool even though, ultimately, it is unrealistic to expect that any one product can address all these scenarios equally successfully. For this reason, most vendors have developed or acquired multiple products (which often have significant variations in architecture, metadata and required skill levels) to address these various requirements. In that context, it is notable that the majority of responses using Informatica were from companies using a single product (PowerCenter) whereas users of IBM, Microsoft and Oracle products were typically using multiple products from that vendor. As a result, readers may wish to treat Informatica's results as if they derived from a single tool.

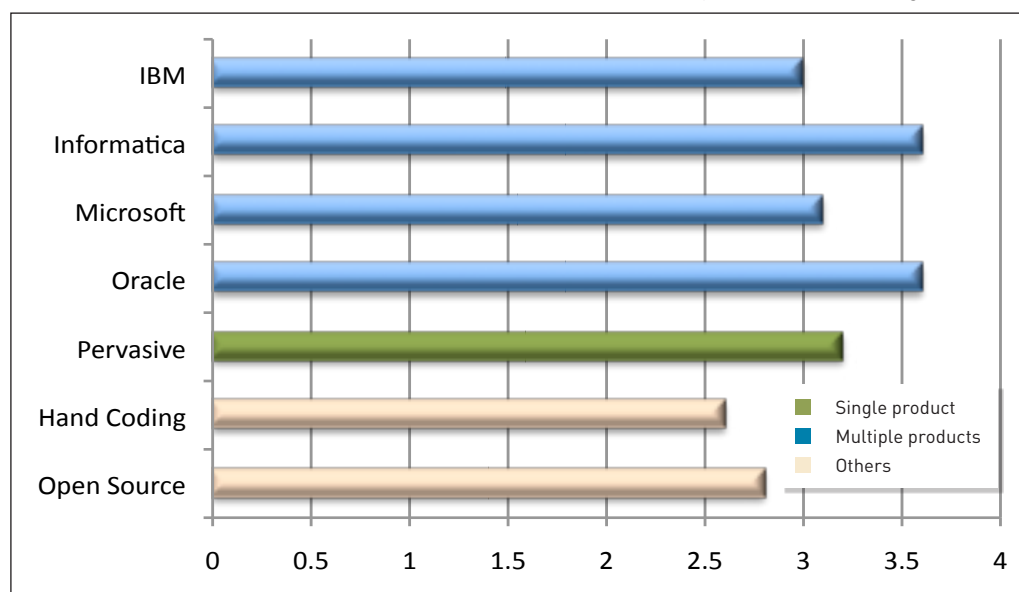


Figure 1: Average number of scenarios for which products/vendors are considered suitable

The conclusion from Figure 1 would appear to be that the product sets from Informatica and Oracle are considered by their users to be more reusable than their competitors, though

the differences are not large. Open source and hand-coded solutions lag behind proprietary solutions in terms of perceived reusability.

Using data integration platforms

Project plans across scenarios

Following on from the previous question we asked respondents about the number of projects, by scenario, for which he or she had actually used the platform, or planned to use it over the next three years, as opposed to what they thought the product would be suitable for.

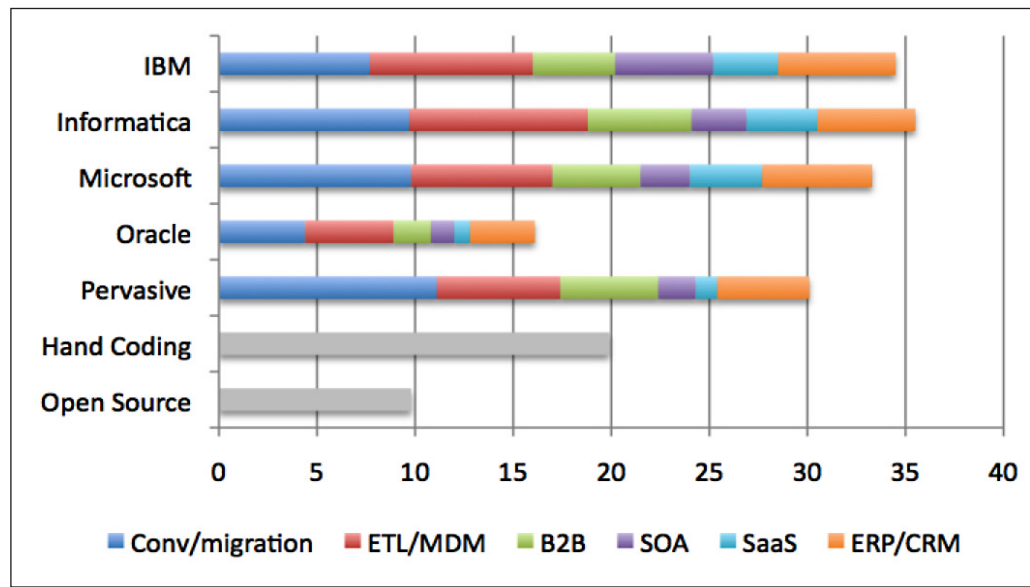


Figure 2: Average number of projects, per company, implemented or planned over 3 years

	Conv/migr	ETL/MDM	B2B	SOA	SaaS	ERP/CRM	Total
IBM	7.7	8.3	4.2	5.0	3.3	6.0	34.5
Informatica	9.7	9.1	5.3	2.8	3.6	5.0	35.5
Microsoft	9.8	7.2	4.5	2.5	3.7	5.6	33.1
Oracle	4.4	4.5	1.9	1.2	0.8	3.3	16.1
Pervasive	11.1	6.3	5.0	1.9	1.1	4.7	30.1
Hand coding							19.9
Open Source							9.8

In terms of product/vendor ranking, there is a significant difference between these results and those in the previous section, most notably that Oracle was perceived to have capabilities for handling a wide range of projects, yet the actual plans companies had to reuse that company's products was much more limited.

Another finding is that it would appear that the most common reason for purchasing a data integration platform is not, as one might expect, for ETL and data management uses but, in fact, for data migrations and conversions. This is illustrated in the following table and chart (Figure 3).

• B2B	16%
• Conv/Migration	29%
• ETL & MDM	23%
• SOA	9%
• App. Sync	16%
• SaaS	8%

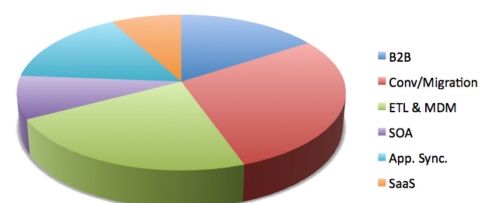


Figure 3: Overall distribution of integration scenarios

Using data integration platforms

Project timelines and resources

For any one integration scenario, the projects themselves can vary in scale and complexity. In this section, we look in more detail at the amount of effort (in man-weeks) that was actually devoted to projects within each scenario. We did this by asking about the percentage of projects that absorbed 0–2 person weeks, 2–6 person weeks, 6–12 person weeks and so on. We then calculated the weighted average as described in Appendix C.

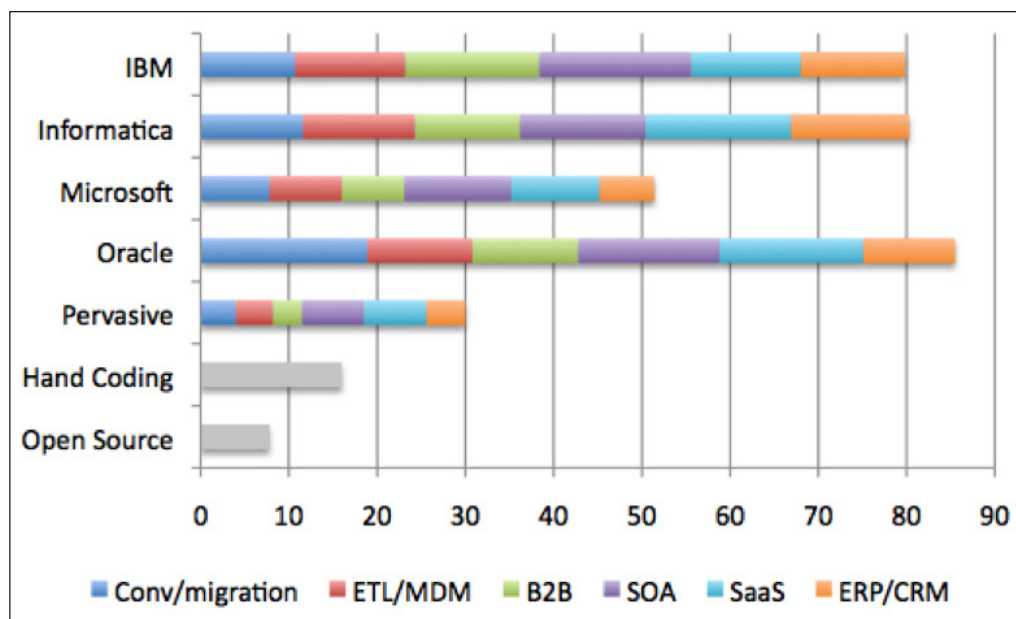


Figure 4: Average resources (person-weeks) spent per project

	Conv/migr	ETL/MDM	B2B	SOA	SaaS	ERP/CRM	Average
IBM	10.7	12.5	15.2	17.2	12.4	11.8	13.3
Informatica	11.6	12.7	11.9	14.2	16.5	13.4	13.4
Microsoft	7.8	8.2	7.1	12.1	10.0	6.2	8.5
Oracle	18.9	11.9	12.0	16.0	16.3	10.4	14.3
Pervasive	4.0	4.2	3.3	7.0	7.1	4.4	5.0
Hand coding							16.0
Open Source							7.8

One of the interesting findings here is that, for each vendor, SOA and SaaS projects take significantly longer, on average, than other types of projects. More significantly, there are surprising differences between the products in terms of overall productivity. It seems at first sight that Pervasive is clearly the most productive environment, such that you can complete projects in less time than with any of the other products. At the same time, it is worth noting that average project effort is not solely a reflection of the efficiency (or inefficiency) of the integration platform being deployed. Another key factor that might contribute to these results is if there may be a consistent difference in project scale and complexity being addressed by users of IBM, Informatica and Oracle versus Pervasive or Microsoft, a factor that we cover in the next section. Readers will need to form their own opinion of which of the outlined possibilities is most likely.

Using data integration platforms

Scale and complexity

One of the challenges that we faced in collecting and interpreting the data relates to project scale and complexity. While it is relatively easy to capture information on the number of person months required to complete a project, this resource allocation does not necessarily reflect project complexity. What we have identified and measured as one useful indicator of both scale and complexity

is the average number of sources and targets used in each project. While this does not tell us about the types of transformations and validations required (which must impact overall project cost in some way) it does give us a metric for the complexity of the overall environment and the likely scale and complexity of each project. It certainly provides another dimension for both cost comparisons and project planning purposes.

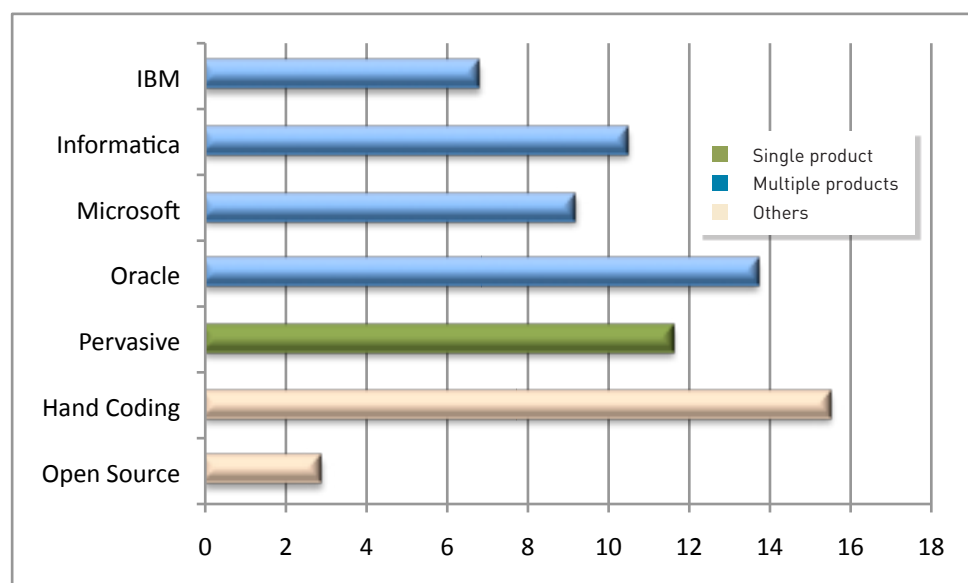


Figure 5: Average number of end points (sources and targets) per project

The most surprising number here relates to IBM (see discussion in the highlighted box below). Our opinion is that this number probably does not accurately reflect the true average for IBM-based projects which typically involve more end points. The same concern applies to the survey data for hand coding, except that this overstates the number of end points.

There are a number of anomalies in this report with respect to IBM's results. In particular, it has an unusually high number of SOA projects, an unusually low number of sources and targets per project and unusually high costs. If we take results for DataStage and InfoSphere installations only, as opposed to those who are using 'multiple IBM products', then the figures are much more in line with what one might expect. We suspect that respondents using 'multiple products' are including things such as WebSphere within their considerations and this has distorted the results. Unfortunately, we do not have enough results for DataStage and InfoSphere users to present this as statistically significant so the figures are present are for all IBM users. However, readers should bear this caveat in mind when examining IBM results.

Using data integration platforms

Ramp up time and effort

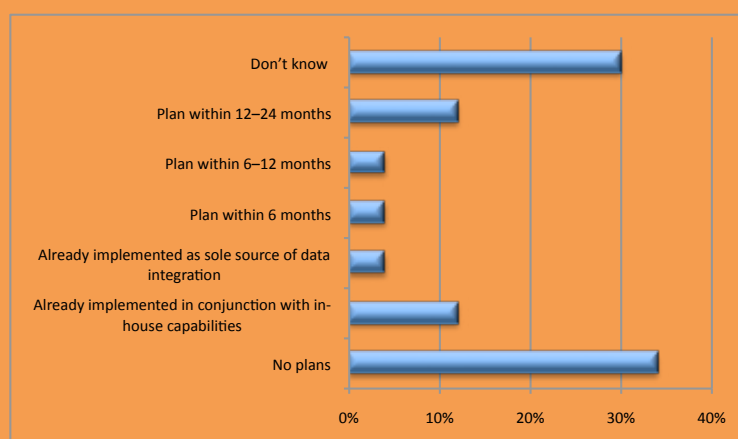
We asked a dual question about ramp up time: how long it took to learn to use the product well enough to build the first solution, and what resources (either internal or external) were actually used to build that solution. Averaged answers were as follows:

	Time to learn	Resources required to build first solution		
	Weeks	Internal staff (man weeks)	External consultants (man weeks)	Total (man weeks)
IBM	7.3	10.0	6.8	16.8
Informatica	4.2	7.2	5.1	12.3
Microsoft	4.3	7.4	3.0	10.4
Oracle	6.5	11.9	5.1	17.0
Pervasive	3.0	5.6	2.5	8.1
Hand coding	4.6			5.6
Open Source	6.5			9.8

While we do not know the relative size of first projects it is not unreasonable to assume that, on average, they are comparable across vendors, particularly considering the results on the number of end points in the prior section. On both counts, Pervasive is significantly easier to learn and requires less resource than solutions from the other suppliers for the first project. Of course, it must be remembered that many of the users of the tools from other vendors have actually purchased multiple products and one would therefore expect a longer learning curve.

Cloud Integration

As an ancillary question we wanted to find out about companies' usage and plans for cloud and SaaS based solutions for data integration. The results are illustrated in the following diagram:



While some users of all the vendors plan to implement cloud or SaaS based data integration solutions in the future only Informatica (1), Microsoft (9) and Pervasive (7) had such implementations today. Each of these had a single customer whose solution was wholly based on this platform. IBM's customers were far more likely to have no plans for cloud or SaaS with 60% having no such plans.

Cost elements

The primary goal of our research was to explore the costs involved in acquiring and using (over a three year period) the respective products/vendors. Product acquisition decisions are based on a variety of factors, but costs in relation to budgets are invariably a key driver. All too often, however, the cost elements are hard to gauge or not well understood, so in this section we pull all our data points together and provide a comprehensive analysis of total costs over time, covering traditional TCO as well as costs per project and per end point (that is, source or target systems).

Initial costs—software and hardware

Licensing structures and pricing points for software can vary enormously between vendors and, with the growing adoption of SaaS/cloud applications and infrastructure, the range of options is getting broader. As a first step, we asked how users licensed their software and found that 18% had subscription-based pricing vs 82% for the more conventional perpetual licensing model. All of the IBM users fell into the latter category. We then combined these results with users' expenses for new hardware (where needed), any

additional software required to support the integration products, and training and implementation costs for a first year total. The table below shows these first year costs based on a conventional licensing model. There were also a relatively small number of users (although none in the case of IBM) who had opted for a subscription-based licensing model and, while there were not enough of these to make them worth presenting in detail, they do affect the total average costs, which are presented in the following list.

IBM	\$834,531
Informatica	\$226,367
Microsoft	\$185,113
Oracle	\$307,061
Pervasive	\$ 98,368
Hand coding	\$ 87,000
Open Source	\$108,333

These figures speak for themselves: in particular that Pervasive offers by far the lowest cost for initial acquisition and deployment, even under-cutting the costs of open source options (probably because of the need for enterprise—non-free—versions of these products). IBM, on the other hand, is by some margin the

Initial costs

	License costs	Additional hardware	Additional software	Implementation	Total first year costs
IBM	\$175,781	\$270,156	\$51,094	\$337,500	\$834,531
Informatica	\$ 41,089	\$ 92,450	\$32,507	\$ 88,679	\$254,726
Microsoft	\$ 36,828	\$ 37,591	\$67,349	\$ 62,599	\$204,367
Oracle	\$ 85,472	\$104,018	\$20,738	\$132,578	\$342,806
Pervasive	\$ 29,390	\$ 18,455	\$21,873	\$ 12,531	\$ 82,250
Open Source*					\$105,000
Hand coding*					\$ 87,000

Annual/ongoing costs

	Maintenance fees	Hardware	Admin	Internal tech staff	External consultants	Total annual costs
IBM	\$75,750	\$45,875	\$74,438	\$107,375	\$75,063	\$378,501
Informatica	\$46,895	\$31,368	\$57,053	\$ 86,000	\$53,105	\$274,421
Microsoft	\$16,343	\$21,969	\$33,438	\$ 48,156	\$28,938	\$148,844
Oracle	\$30,500	\$26,778	\$35,222	\$ 46,111	\$42,778	\$181,389
Pervasive	\$23,194	\$12,278	\$18,944	\$ 50,278	\$11,056	\$115,750
Open source*						\$ 32,677
Hand coding*						\$127,300

* Additional information based on limited number of responses for first year and on-going costs

Cost elements

most expensive, for reasons we have previously discussed. As an example (not statistically significant), it turns out that for respondents only using DataStage or InfoSphere the average costs are \$491,786.

In the long run, the recurring costs of owning or operating any product will outweigh the initial acquisition costs. The data we collected was designed to let us calculate annual (recurring) costs, including administrative costs, maintenance fees, and consulting as well as any costs associated with technical personnel.

With the exception that Oracle's ongoing costs are somewhat lower than we might otherwise have expected, these figures are very much in line with those that have gone before.

Total cost of ownership—over 3 years

In this section we have combined the results of all the cost-related survey questions other than the initial time to learn and time required for needs analysis: they tend to correlate with the total costs so they will merely exacerbate the differences between the least and most expensive solutions listed here. We have assumed for this exercise that data integration products remain in service for at least three years (although the average is probably significantly longer). In this section, we have taken the sum of the first year costs and two further years of recurring costs to derive a total three-year total cost of ownership (TCO) figure, as shown in Figure 6.

Once again, the most economical products come from Pervasive and Microsoft, but these numbers do not tell the whole story. In the next section, we extend the analysis by looking at the number of projects for which each product is used.

Cost per project

Various studies have been published in the past, both for data integration platforms and other software products, which have attempted to identify the costs associated with particular products. However, costs alone are not enough, at least in the case of data integration, because the amount of use you get out of the product is also relevant. If you only run a single three week data integration project once a year, then you are not getting as much value out of the software as you would if you were running a dozen such projects. So we need to divide total costs by the number of projects completed. This results in the average cost per project, as shown in Figure 7.

It is interesting to see how these results are different from those in the previous section. Pervasive, followed by Microsoft, continue to lead in providing a significant overall value advantage. However, as multiple projects are factored into the comparison, Oracle has slipped well behind Informatica. Also of interest is the relatively high cost of both open source and hand coding although the numbers are not statistically reliable.

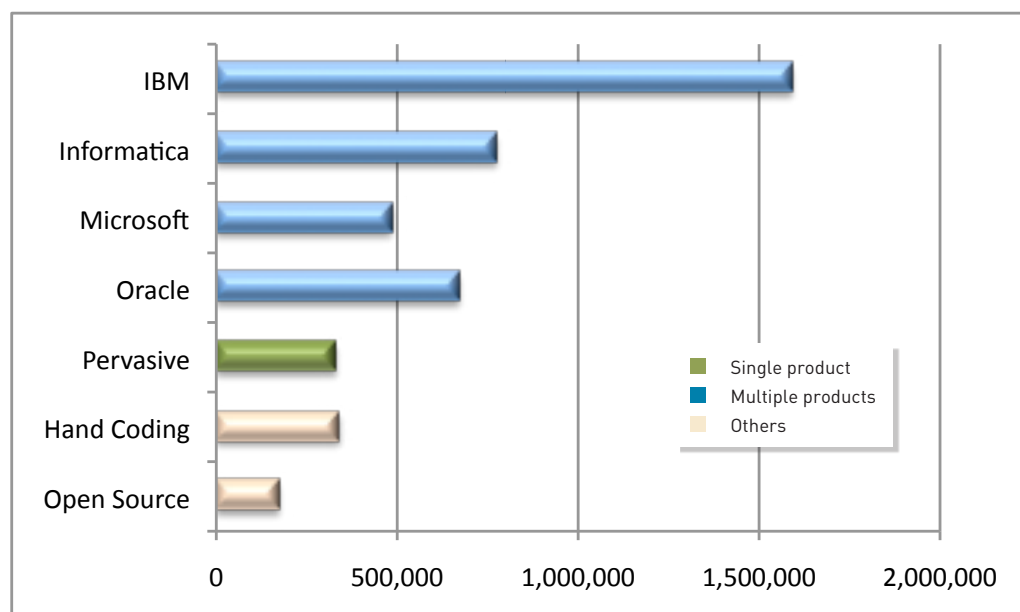


Figure 6: Three-year Total Cost of Ownership (TCO)

Cost elements

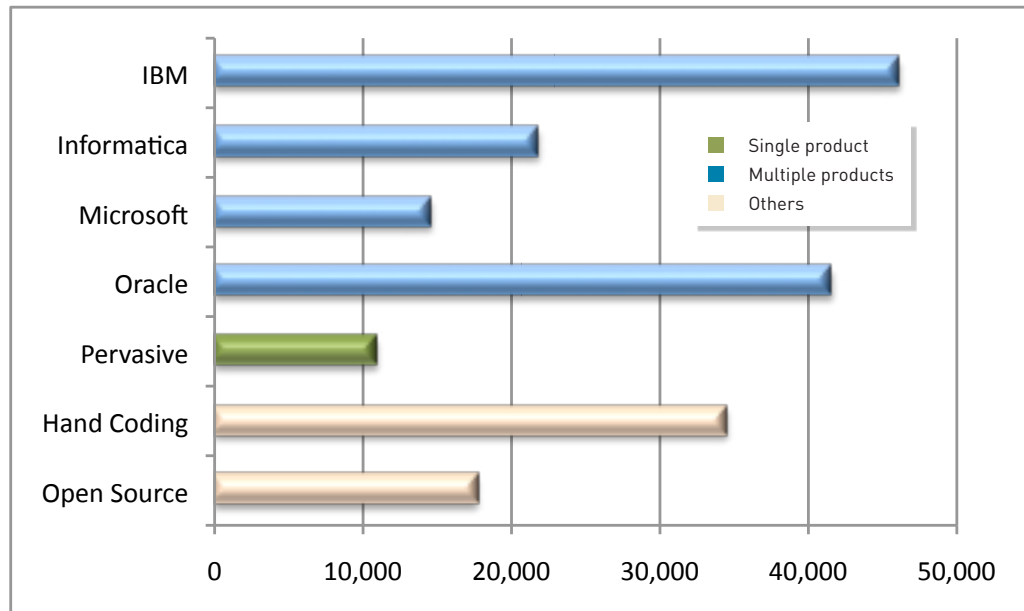


Figure 7: Average cost per project

Project cost per end point

While cost per project is a very useful measure when comparing products, there is a further dimension that can help to define or confirm value and that can provide a basis for planning integration initiatives. By collecting data on the number of sources and targets (end points) involved with these projects, we can allow for project scale and complexity in the comparison of product costs. In addition, since reusability of integration artefacts (such as source/target schema and logic) is known to be a key

advantage in containing overall integration costs, including the number of end points in our calculations should reflect any differences between the products' productivity advantages.

We believe that the score for IBM has been affected by the factors previously discussed and should therefore be treated with caution. The overall results, however, do continue to align with our other cost-based rankings.

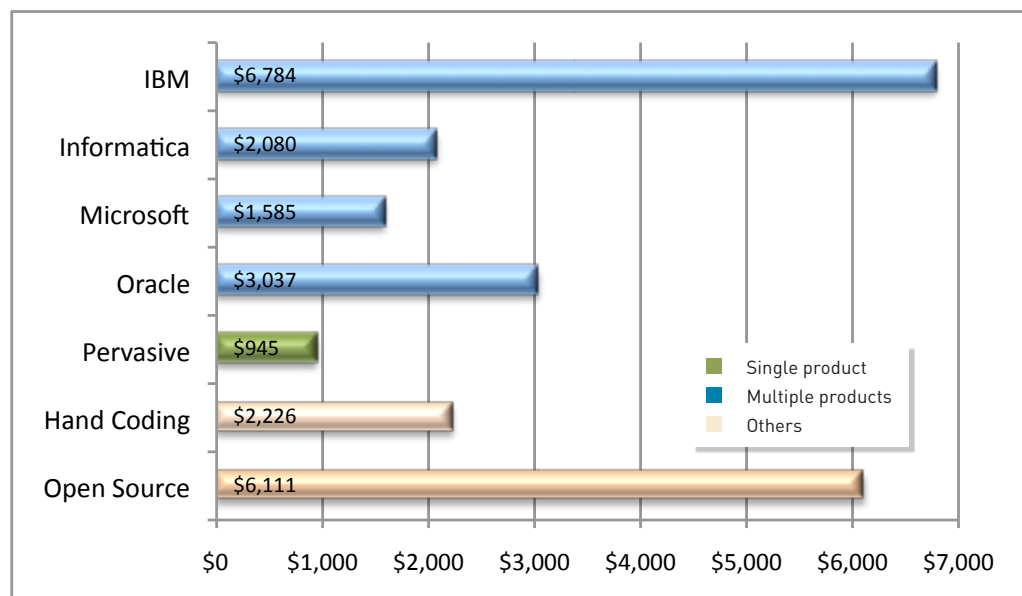


Figure 8: Average costs (3-year TCO) per project per end point (sources and targets)

Conclusions

Several major themes emerge from the data that we collected for this report. Organisations adopt integration products for a disparate range of integration scenarios: there is clearly no shortage of data integration challenges. Secondly, our results show dramatic, and sometimes surprising, differences between vendors and products in both overall TCO and in cost per project and cost per source and target system.

Reusability across multiple scenarios is potentially very valuable in terms of both ROI and, we can assume, organisations' agility in the face of change. Our numbers appear to show that Informatica and Oracle are considered by their users to be somewhat more reusable than their competitors, although they are all at a similar level. In terms of actual usage, the average number of projects per product or vendor was mostly in the 30 to 40 range over a three year period, but Oracle (and open source) had significantly lower numbers, thus confirming the flexibility offered by other product sets, headed by Informatica.

In terms of project timelines and effort, Pervasive appears to be the easiest product to learn and requires the fewest resources for development of a first integration solution. With respect to initial development, Informatica and Microsoft hold the middle ground behind Pervasive and are followed by IBM and Oracle.

The rankings between vendors on costs appears consistent, whether measuring initial (first year) costs, ongoing costs or more detailed breakdowns including projects and number of end points. In our view, the figures speak for themselves: in particular that Pervasive offers by far the lowest cost both for initial acquisition and subsequent deployment, even under-cutting the costs of open source options. Microsoft was the next closest in terms of total costs, and these comparisons hold up (or are accentuated) when we calculated costs per project, although Oracle slipped behind Informatica and IBM in this comparison.

One area of surprise to many will be the poor showing for open source integration tools. This may be explained by the limited number of responses received. Leaving this aside, although the open source products fared well against products at the top-end of the price curve (such as IBM and Oracle), they did not compare particularly well against the more cost-effective

products—in particular, Pervasive's integration product bested the open source tools in nearly every category. Although the open source results did not meet our statistical significance thresholds, the results are potentially indicative and are sufficiently meaningful to warrant publication, albeit with a disclaimer.

While the same caveat also applies to hand coded solutions, it is noticeable that Pervasive, Microsoft and Informatica all work out as more cost-effective than hand coded solutions once you take into account how reusable these products are across multiple projects. Of course, this is the story that these vendors have been emphasising for some years, but it is good to have evidence that this is, indeed, the case.

We are inclined to make an additional observation, based on all of these results, that there may be a certain stratification of the market, with Informatica, Microsoft and Pervasive (and open source products) being used successfully to deliver short and medium length projects, while IBM, Informatica and Oracle (and hand coding) compete for all lengths of projects. This is, nonetheless, an observation and not a firm conclusion that can be asserted from the survey numbers. Indeed, if anything, the results on the number of sources/targets per project (end points) do not support this view, though numbers of end points do not tell the whole story with respect to project complexity.

We should add one final note on product functionality for specific tasks. The more frequently a vendor or product is used, in different scenarios, is certainly a reflection of the functionality of the product, but we must make the caveat that we have not attempted to distinguish between products on the basis of their functionality: so one product may be more suitable for supporting complex transformations than another, for example. Similarly, another product may offer better performance or have more real-time capabilities or have features that are not present elsewhere. Thus cost is, and should be, only one of several determining factors when selecting data integration solutions.

Further Information

Further information is available from
<http://www.BloorResearch.com/update/2042>

Appendix A: Methodology

In order to gather the appropriate information to reach our conclusions Bloor Research conducted a survey which produced 341 responses from companies using data integration tools (or, in some cases, using hand coding) for a variety of purposes. However, some of the respondents provided no data on costs and we were therefore forced to exclude them from our analysis. In addition, there were some sets of answers where it appeared that the respondents had simply checked the same box multiple times rather than providing any sort of thoughtful answer to the question. Interestingly, the vast majority of such answers were provided by consultants! In any case, we felt obliged to ignore these answers, and consequently the results of this survey are based on 163 completed responses.

The survey was conducted within Bloor Research's own subscriber community and through contacts provided by Pervasive Software, which sponsored this research. This has resulted in a significant preponderance of Pervasive customers within the survey, along with that company's most commonly encountered competitors, notably Microsoft. No relevance should be attached to this fact.

We received a significant number of responses from companies using Informatica, Oracle and IBM products. While we also had replies from companies using SAP Business Objects, Dataflux, Ab Initio, Talend and other open source products, as well as various others, none of these were in sufficient numbers to make an analysis of these products statistically significant. Similarly, we could not include hand coding results because a disproportionate number of those responses (more than two thirds) failed to include information on costs. Nonetheless, we have included foot notes with data points on open source and hand coded solutions because these approaches are important in presenting an overall context for this survey.

One final point should be clarified. We did not simply ask users to check the name of the vendor whose products they used but to indicate specifically which product or products they used. Thus for IBM, for example, we had responses for "IBM: multiple products", "IBM: DataStage" and "IBM: InfoSphere". In the figures that follow we have added all these results together (but we have not included Cast Iron, which was recently acquired by IBM) and do not present them separately. Similar points apply to Informatica, Microsoft and Oracle though we did not have to do this for Pervasive because of their strategy of delivering a single unified product for multiple integration scenarios. This has a number of consequences that readers should bear in mind when considering the results that follow:

1. A single product should (there is no guarantee) require less time to learn and use than multiple products.
2. One would expect a suite of products to offer more flexibility than a single product.
3. The average cost for "multiple products" is under-stated in our cost figures, because of the inclusion of single product users.
4. The average cost of single products from vendors with multiple products is over-estimated, because of the inclusion of multiple product users.

Readers should know that the majority of IBM, Microsoft and Oracle users responding to this survey indicated that they were using 'multiple products'. This was not the case with Informatica, with the majority simply being PowerCenter users: in this respect and with due caution, Informatica results can be treated more like a single product response.

A more detailed listing of the vendors whose products were in use is provided in Appendix B.

Appendix B: Vendors/products identified by survey respondents

The following were the total numbers of respondents by vendor, in descending order:

Microsoft	75
Pervasive	60
Informatica	40
Oracle	35
IBM	31
Hand coding	29
SAP (including Business Objects)	9
Open source (including Talend – 2)	6
Cast Iron (not included in IBM figures)	6
Software AG (WebMethods)	5
Boomi	4
Dataflux	3
Ab Initio	2

There were a large number of other products in use by just one respondent.

Appendix C: Methodology for “bucket questions”

Many of the questions asked in our survey involved multi-part answers with “bucket” style answers. For example, in the question asking about the lengths of projects we asked respondents to tell us what percentage of their projects fell into the ‘less than 2 weeks’, ‘2–6 weeks’, ‘6–12 weeks’, ‘12–24 weeks’ or ‘more than 24 weeks’ categories. In order to calculate averages, we took the median (that is, the half-way point) within each range and applied that as the multiplier for the relevant figure or percentage. For the top range, which was unlimited, we had to take a reasonable figure and apply this.

Bloor Research overview

Bloor Research is one of Europe's leading IT research, analysis and consultancy organisations. We explain how to bring greater Agility to corporate IT systems through the effective governance, management and leverage of Information. We have built a reputation for 'telling the right story' with independent, intelligent, well-articulated communications content and publications on all aspects of the ICT industry. We believe the objective of telling the right story is to:

- Describe the technology in context to its business value and the other systems and processes it interacts with.
- Understand how new and innovative technologies fit in with existing ICT investments.
- Look at the whole market and explain all the solutions available and how they can be more effectively evaluated.
- Filter "noise" and make it easier to find the additional information or news that supports both investment and implementation.
- Ensure all our content is available through the most appropriate channel.

Founded in 1989, we have spent over two decades distributing research and analysis to IT user and vendor organisations throughout the world via online subscriptions, tailored research services, events and consultancy projects. We are committed to turning our knowledge into business value for you.

About the author

Philip Howard Research Director - Data

Philip started in the computer industry way back in 1973 and has variously worked as a systems analyst, programmer and salesperson, as well as in marketing and product management, for a variety of companies including GEC Marconi, GPT, Philips Data Systems, Raytheon and NCR.



After a quarter of a century of not being his own boss Philip set up what is now P3ST (Wordsmiths) Ltd in 1992 and his first client was Bloor Research (then ButlerBloor), with Philip working for the company as an associate analyst. His relationship with Bloor Research has continued since that time and he is now Research Director. His practice area encompasses anything to do with data and content and he has five further analysts working with him in this area. While maintaining an overview of the whole space Philip himself specialises in databases, data management, data integration, data quality, data federation, master data management, data governance and data warehousing. He also has an interest in event stream/complex event processing.

In addition to the numerous reports Philip has written on behalf of Bloor Research, Philip also contributes regularly to www.IT-Director.com and www.IT-Analysis.com and was previously the editor of both "Application Development News" and "Operating System News" on behalf of Cambridge Market Intelligence (CMI). He has also contributed to various magazines and published a number of reports published by companies such as CMI and The Financial Times.

Away from work, Philip's primary leisure activities are canal boats, skiing, playing Bridge (at which he is a Life Master) and walking the dog.

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