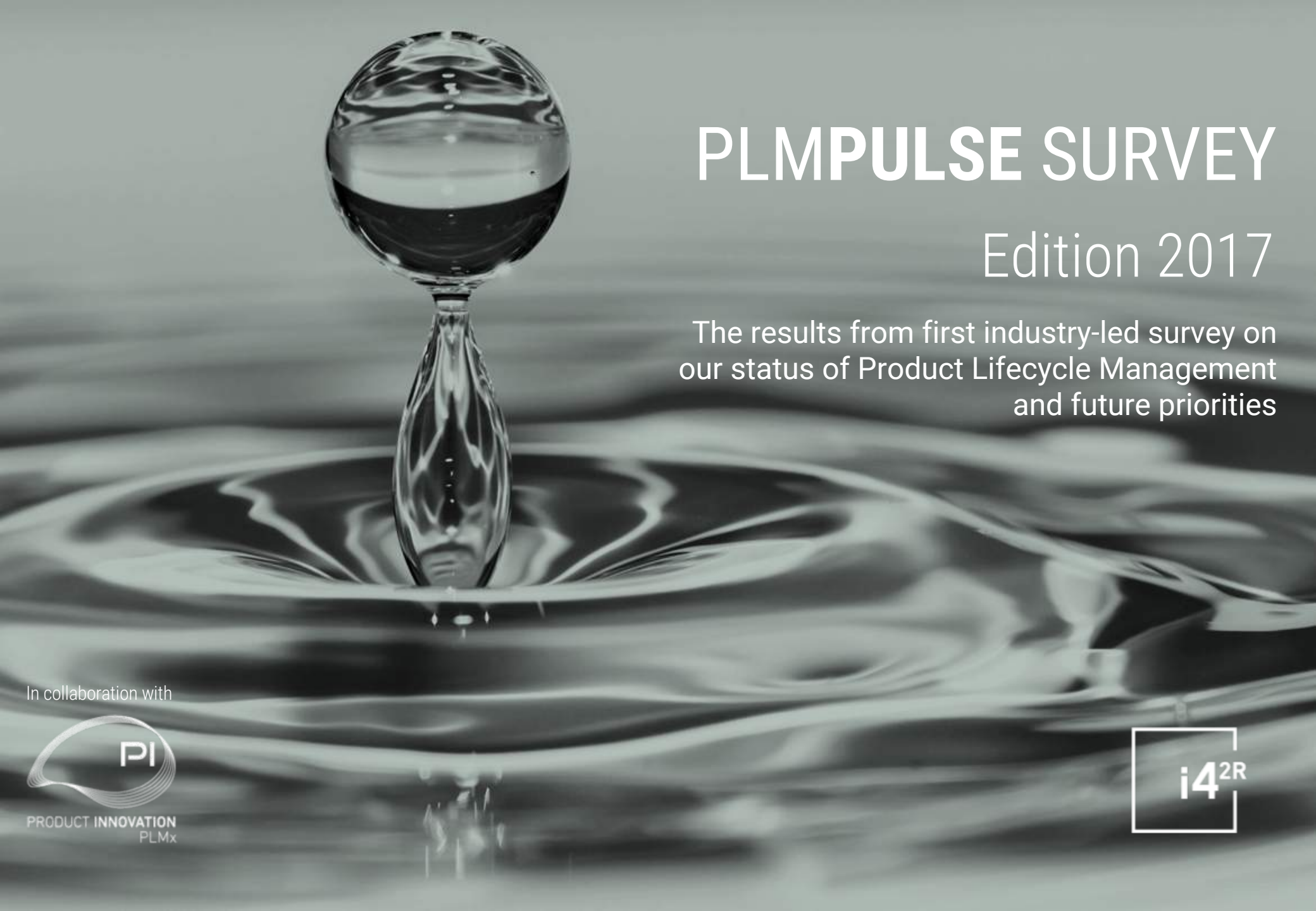

PLM**PULSE** SURVEY

Edition 2017

The results from first industry-led survey on our status of Product Lifecycle Management and future priorities

In collaboration with

PRODUCT **INNOVATION** PLMx

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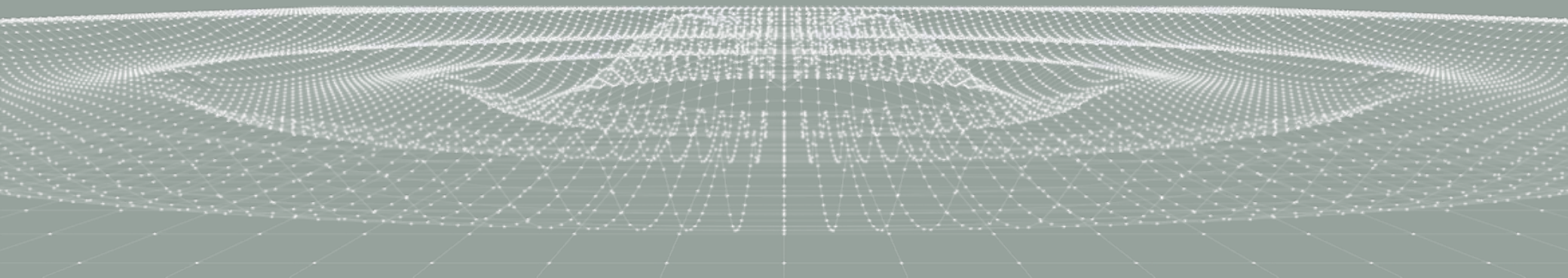

Foreword

1

FOREWORD

Introduction by Nicholas Leeder

Nicholas Leeder presenting at the launch of PLMPulse Survey at PLMx Texas in October 2017.

Over the years I have been involved with and attended many PLM conferences, both driven by the PLM vendors or independently organised such as PI PLMx by MarketKey Limited. Much of the content provided fantastic insight into how companies have addressed their own PLM journeys and often the presentations focused on PLM being the next big thing.

I started my own journey with PLM around 1996, now over 20 years ago. PLM has always promised so much in terms of benefits. Today is no different… there is a lot of talk about PLM again, with Industrie 4.0, Internet of Things (IoT) and big data promising to finally unleash PLM's potential.

But have we really progressed further than the initial use of the tools to manage CAD and Engineering data?
Has PLM and our own implementations of it led to the benefits and reached the marketing hype?

PLMPulse is the first industry-led survey hoping to shed some light into where we are in our PLM journeys and where the real value lies. It is not meant to be an academic or consulting research paper, but rather a temperature check of how industry sees PLM today – the pulse.

The team and I were fascinated by the results but not surprised by the outcome. As you will be able to see from the report, industry with its often confused and fractious relations with PLM and technologies still has a long way to go before the potential is fully realised.

FOREWORD

Most importantly are the conclusions to this report. They should guide us to how we, as industrial users of PLM, should use this information to change and adapt when defining PLM within our own organisations. If PLM is to be the next big thing, then its role beyond engineering and executive level sponsorship needs to change. This new secured foundation will allow organisations to strengthen PLM for the future, gaining greater value from the information inside of PLM and create the backbone for the inevitable Internet of Things (IoT) and digital business model transformations.

Finally, I would like to thank everybody who participated in the survey. With over 300 survey responses, the reaction from industry has been phenomenal. This uptake demonstrates how important this topic is for industry. In addition, the support from the teams at Husqvarna, Dyson, Stannah Stairlifts, SKF and TI Automotive in defining the scope of the survey was essential to success of the PLMPulse Survey.

Nicholas Leeder

Co-Founder of PLM**Pulse**

Follow Nick on twitter at @LeederNick and engage in the conversation.

"PLM needs to be recognized as a business system alongside ERP to the least… managers should commit to the promotion of PLM within and outside their organisation…"

Anonymous survey comments submitted

Executive Summary

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EXECTUIVE SUMMARY – REPORT HIGHLIGHTS

Business use of PLM

Is PLM predominantly used by Engineering functions or is there a wider adoption in organisations?

- PLM has yet to be adopted more widely in the enterprise, with the main functional use in Engineering departments and information centred around technical product information.
- The usability of the PLM tools and breadth of information may be limiting its wider adoption in the business.

PLM Value Case

Is the value case behind PLM clear and tangible for many organisations?

- Most businesses report that the benefits case for PLM is either intangible or the investment was based on a "must do" need. The focus of the investment is typically cost down, rather than value creation.
- Flexible subscription licensing models present short-term cost reduction opportunities, the adoption of cloud solutions is still very low.

Organisational Readiness

What is the readiness of organisations to elevate and refine the role of PLM?

- There is significant resistance to the adoption of PLM in organisations, even if the benefits are understood. This may be driven by the lack of clear business and executive ownership to support the change in the organisation.
- Most projects are focused on cross-functional process changes. However, the greatest barrier to transformation is reported as modifications to current processes

Value of Information

Are organisations able to extract value from PLM information through insight and analytics?

- Whilst PLM vendors provide tools to analyse PLM information, few companies utilise them past very basic ad-hoc searches. Reporting and Analytics from PLM is typically via extracts and Excel based reports, potentially leading to data integrity issues.
- Therefore, not surprisingly few companies have connected PLM to their big data strategy.

Future of PLM

Will PLM and Internet of Things unleash new value potential for organisations?

- The future of PLM is linked to the Internet of Things (IoT) and the majority of responders aim to connect it to their digital strategy. Yet most companies report their PLM implementation is neither ready for IoT nor there is a near term plan to change.
- The greatest barriers are reported as clarity of PLM's role, especially with other enterprise systems. New "buzz-word" terms are causing more confusion.

EXECUTIVE SUMMARY

Business use of PLM

Is PLM predominantly used by Engineering functions or is there a wider adoption in organisations?

The use of PLM in the business is still dominated by Engineering functions, with 59% of responses indicating the main use by engineering functions and 68% stating it was the main storage of technical product information.

The “L” in PLM refers to “Lifecycle”, yet few companies report PLM supporting their business with product information or usage once it has left their manufacturing facilities. One reason for this restricted use may be the complexity of the PLM tools and the investment in training. 86% of responses indicated PLM was “complex” or difficult to use.

PLM Value Case

Is the value case behind PLM clear and tangible for many organisations?

Over 50% of the responses indicated that the business case behind the investments in PLM are either “intangible” or have been made on a “must do” basis. Clearly this presents organisations with a challenge to demonstrate any tangible ROI on their investment, with 26% reporting their cases were tangible.

The focus of the investments made by the respondents is cost reduction, with efficiency of of process (not IT) being the driver. 26% of the responses also state that their investments in PLM are also focus on supporting new revenue streams, which moves PLM from an efficiency drive to a value creator in organisations.

The traditionally high costs of PLM investments have been historically seen as a barrier to a positive ROI. 60% of the responses state the subscription models for PLM software licensing as a must have or important to remove this software investment of perpetual license models. Only 6% of respondents state they have implemented cloud solutions to remove the investment costs of infrastructure. Security has been sighted as the main reason.

EXECUTIVE SUMMARY

Organisational Readiness

What is the readiness of organisations to elevate and refine the role of PLM?

PLM projects typically are transformational in their nature. 41% of companies report their PLM projects are transforming cross-functional processes. 36% of organisations report that to have acceptance of the projects, the benefits needs to be localised within the departments. 23% of respondents report changes to current to processes as creating a high resistance to acceptance.
One challenge to drive the changes from PLM projects is clear functional ownership in the business. 50% of respondents state that PLM has either mixed or no clear functional ownership in the business. Only 11% report that a functional Executive is accountable PLM.
When then barriers to maximising the benefits from the projects are examined, 88% of respondents state resistance to change as highly impacting benefits realisation. 97% report that having siloed business processes creates barriers to benefits.

Value of Information

Are organisations able to extract value from PLM information through insight and analytics?

Being able to access the information from PLM systems enables companies to create value from it. 62% of survey respondents state that they are unable to access or have to exact information from PLM tools to analyse it. Only 19% of respondents report using the PLM software vendors tools. That said, 66% of respondents stated that the vendors did provide tool to access and analyse PLM data, but the complexity of the tool was barrier to their use.
66% of the respondents stated that either no or only basis Key Performance Indicators (KPI) were taken from PLM. 13% of responses took no KPI information from PLM and 29% used basic part data. It was uncommon for companies to use PLM to measure information such as cost or projects status.
Given the hype around "Big Data", 36% of respondents reported their companies not having a formalised strategy in this area and a further 24% did not have PLM connected to it. Only 15% respondents stated that PLM was connected to their strategy.

EXECUTIVE SUMMARY

Future of PLM

Will PLM and Internet of Things unleash new value potential for organisations?

It is often heard that the future of PLM is the Internet of Things (IoT). 38% of the respondents reporting that PLM was not included in their IOT strategy or would be in the future. A similar percentage reporting that PLM was included and a key part.
59% of the respondents did state that their current PLM implementation was not ready to support IoT and had no or only long term plans to change. Only 7% of companies state their PLM implementation was ready to support IoT.
On reason for the lack of adoption of PLM into companies IoT strategies is the clarity of the role in an Enterprise. 84% of responses stated that the lack of clarity of PLM's role vs. other enterprise systems like ERP was a barrier to enable their IoT initiatives. Further, 43% stated that new terms associated with PLM enabling IoT (like Digital Twin etc) were creating more confusion.

Conclusions

The legacy use of PLM in Engineering functions and the associated complexities of it use have led to organisations limiting it broader us and the expanding the information that the PLM tools contain. The results show that most organisations struggle to tangibly demonstrate the benefits of PLM. The main focus of benefits being the increase of efficiencies and cost reduction, rather than creation of new value or revenues.
If PLM is to expand outside of Engineering and have a wider adoption in organisations, it is clear from the results the accountability of the information and tools need to be elevated out of the Engineering or IT departments and into the board room. It is at executive level that the duplicity of local process protection vs. the scope of cross-functional process change can be addressed and wider benefits be delivered.
Legacy PLM systems contain a wealth for product information which could be critical for the enablement of digital and IoT strategies. Most organisations have not started to the journeys to connect their PLM environments into this fundamental business shift. PLM vendors and consultancies still have have some way to go to help companies accelerate its adoption. The current focus of new technologies and terms is not clear enough for business to embrace.

Background

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THE DRIVE BEHIND PLMPULSE

For so long PLM has promised to deliver large benefits for organisations and today, the hype around the value potential of PLM is only growing. Industry wanted to understand our status…

"The concept of obtaining input and feedback from a diverse range of companies and industries who use a broad array of PLM vendor tools is fantastic."

Anonymous survey comments submitted

Back in July 2017 a group of passionate and inquisitive industry professionals got together to try and understand where companies were in their PLM journeys. The premise was simple: PLM has always promised so much in terms of benefits, but has it delivered and if not, will it ever deliver?

This led to the creation of the PLM**Pulse** Survey.

PLM**Pulse** is the first industry-led survey hoping to shed some light into where we are in our PLM journeys and where the real value lays. It was not meant to be an academic or consulting research paper, but rather a temperature check of how industry sees PLM today – the pulse.

The surveys we created this year explored 5 key questions which have been asked by a diverse set of companies such as Dyson, Husqvarna, SKF, and Stannah Stairlifts and TI Automotive. This group of companies not only represented different industry groups and focuses, but also companies at different stages of their PLM journey.

We knew these questions have been asked many times. We have all seen the presentations at the PLM conferences we attend. But where are we on the journey, and where to we go next?

THE 5 AREAS OF QUESTIONING BEHIND THIS YEAR'S SURVEY

Five hypothesis were developed to explore the status of PLM today in many organisations, our readiness to change and the future potential of PLM for many organisations

The five areas below outlined the basis of the survey in 2017. We wished to explore both the usage and the perceived value drives for PLM today. But if PLM is able to deliver on the hype and promise, we needed to explore our readiness in our organisation to change.

Much of the hype we see about PLM today is both centred around its role in “Big Data” and and the Internet of Things (IoT). We wanted to explore the connection of PLM to organisations strategies in these areas and how prepared PLM is to support the digital drive.

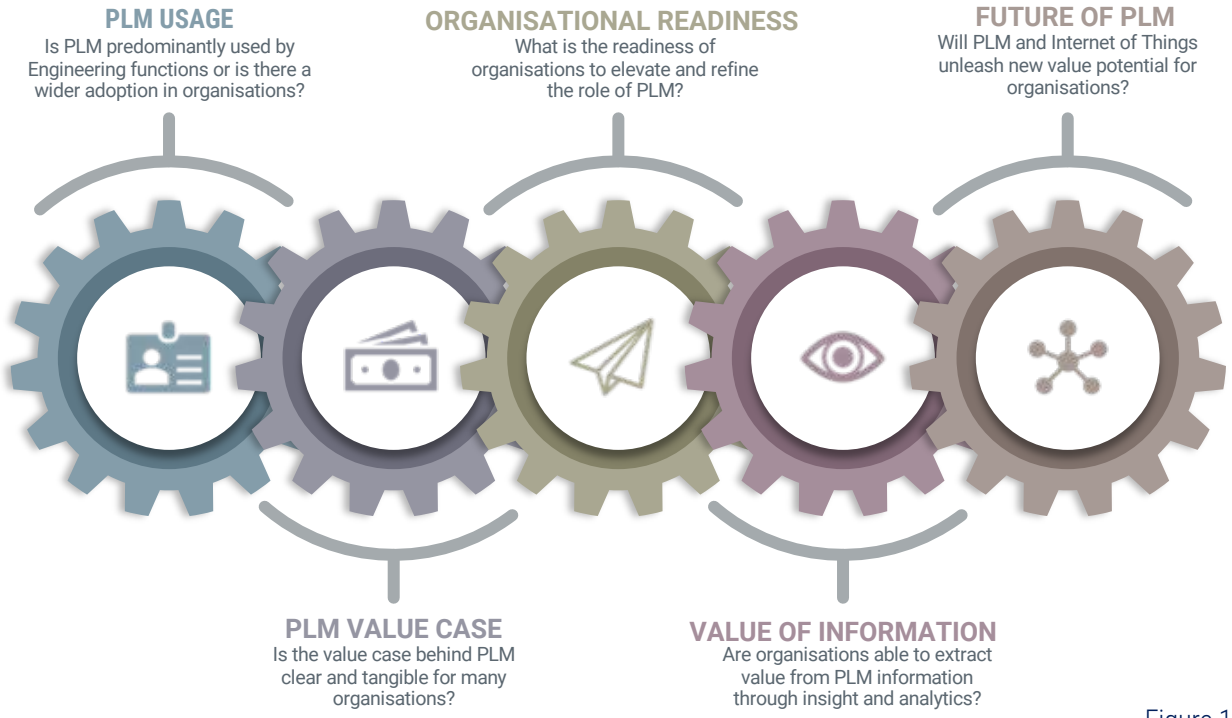


Figure 1: The 5 areas of questioning for PLMPulse Survey Edition 2017

DIVERSE INDUSTRY AND COMPANY SIZE FEEDBACK

The responses represent a diverse set of industries, mainly from large companies in the discrete manufacturing sectors, indicative of industry use of PLM.

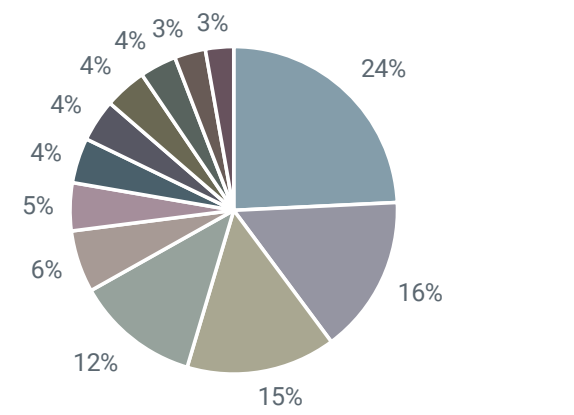


Figure 2: Survey responses by industry sector

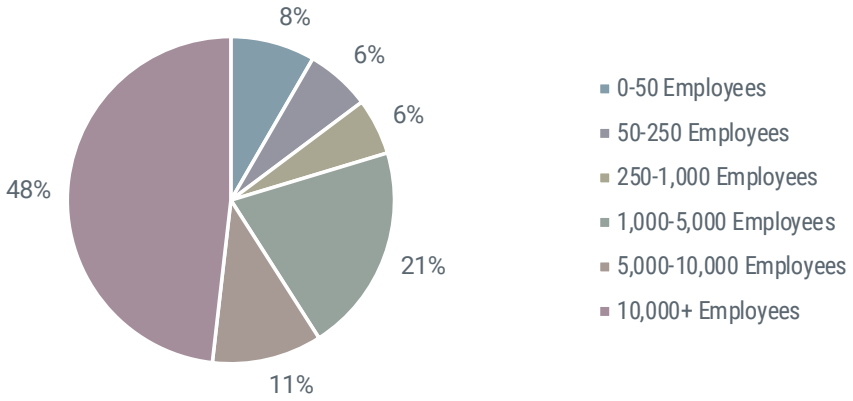


Figure 3: Survey Responses by Company Size

As part of the surveys, respondents provided feedback on the industry and size of their company.

Industry

The discrete manufacturing industries have dominated the responses from the PLMPulse Survey. The top 4 industry groups account for 67% of the responses. This industry bias represents the historical use of PLM in certain industry sectors.

We see very little uptake from the process or asset intensive (e.g. Energy and Utilities) industries. This is indicative of the penetration of PLM in those industry sectors. For future surveys, more input from these sectors would be valuable and also insightful for the traditional user groups.

Company Size

Like the industry sectors, nearly 50% of the responses came from companies with over 10,000 employees. Like the industries, this bias has been driven by historical PLM penetration.

Medium enterprises (1,000 - 5,000 employees) represent the next major segment of responses, with the SME businesses making up the remainder.

The size of the company should be tracked in further surveys, to see if PLM's penetration moves from large companies down to the supply chain. This move can be observed in section 5 of the report.

BUSINESS ENTHUSIASM BEHIND THE SURVEY

The respondents of this year's survey represent a diverse set of industries, countries and company size, making PLMPulse a truly global initiative.

The level of interest from the business in participating in the PLMPulse Survey has taken everybody by surprise. In total, 359 responses to the different surveys were received. Over the 12 weeks the survey was accessed by over 900 persons from over 27 different countries.

Figure X shows the top 10 countries that accessed the survey. This result represent the majority of the largest countries by GDP and representing 42%[1] of the global GDP.

This makes PLMPulse one of the first truly global surveys on PLM.

Looking forward, future PLMPulse surveys should also target feedback from Asian economies further, particularly China.

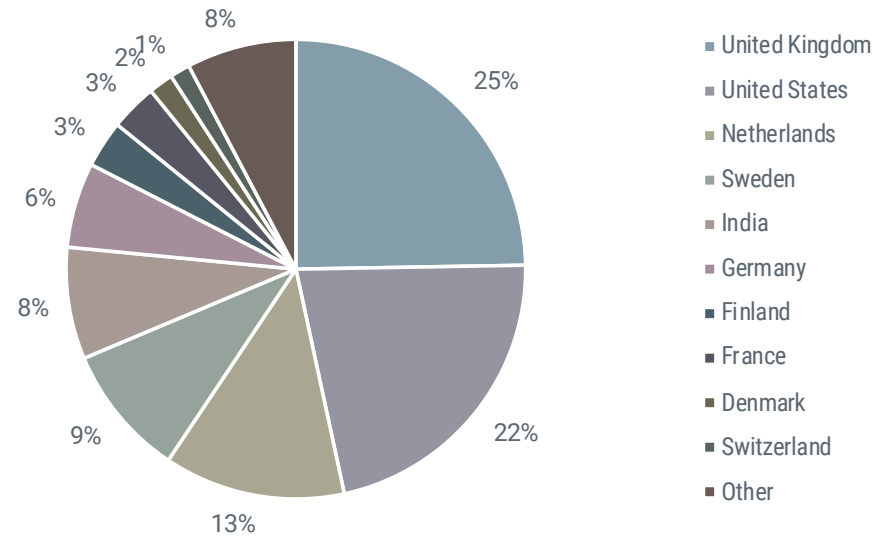


Figure 4: Top 10 countries accessing PLMPulse Survey

Notes
1. GDP based on International Monetary Fund World Economic Outlook (April - 2017)

Organisational Use of PLM

Is PLM predominantly used by Engineering functions or is there a wider adoption in organisations?

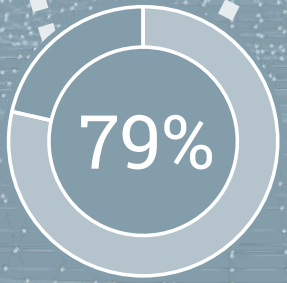
4

SUMMARY OF FINDINGS

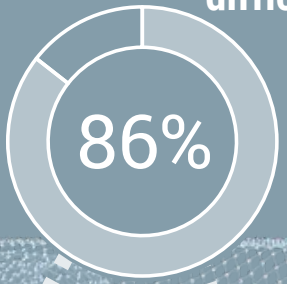
The conclusions show that organisations have yet to adopt PLM more broadly outside of Engineering functions. This could be down to poor usability of the tools and limited scope of product information.

Is **PLM predominantly used by Engineering functions** or is there a wider adoption in organisations?

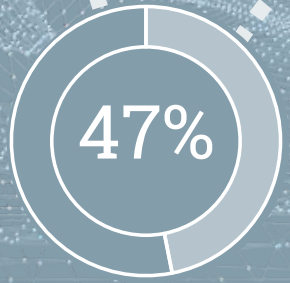
of usage is still **focused on engineering functions**



of information is **centered on Engineering and Manufacturing**



describe PLM as **"complex" or "difficult" to use**



do not use the vendor applications to access the data

PLM **usability and wider information** are main barriers to broader use.

Who in your organisation uses PLM?

Usage of PLM must break out of Engineering functions. This will allow businesses to gain greater value using product information.

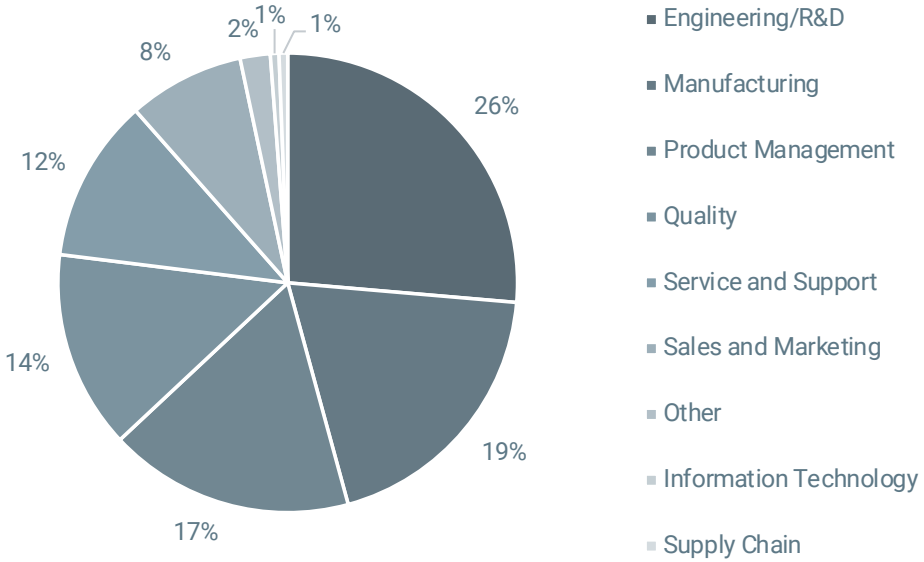


Figure 5: Who in your organisation uses PLM?

Key Findings

- The largest user group of PLM indicated by the respondents was Engineering and/or Research and Development (R&D) departments which represented 26%.
- 17% indicated that Product Management functions in an organisation were users of their PLM application.
- 12% of respondents indicated that Service and Support functions used PLM.

Conclusions

- 59% of the respondents indicated that PLM was used by Engineering[1] functions within the organisation. This is most likely due to the legacy focus of PLM applications in these functional areas.
- A high usage was indicated in Product Management areas of an organisation. Their usage should be further explored in future surveys.
- The use of PLM in supply chain functions and in the aftermarket[2] is low compared to other functional areas. It should be explored further if this is due to other applications containing product information and whether they are connected to PLM.

Notes
1. Engineering functions are defined as Engineering R&D, Manufacturing and Quality
2. Aftermarket is defined as Service and Support, functions which support the end user in the field

What information does your PLM system contain?

The more information PLM contains across the lifecycle of a product, the more value an organisation can gain from PLM and is indicative of broader use in a business.

Key Findings

- The core of information typically held in PLM systems is traditional Engineering Information which represented 33%.
- Manufacturing and quality information accounted for 35% of the responses
- 11% of respondents stated that their PLM systems contain Service and In-field information

Conclusions

- 68% of the respondents indicated that PLM was used store Engineering[1] information within the organisation. This is most likely due to the legacy focus of PLM applications in these functional areas.
- Limited information was stored outside of Engineering, especially about the product once it was manufactured, limiting the through lifecycle usage of the system. This information may be stored in other business applications.

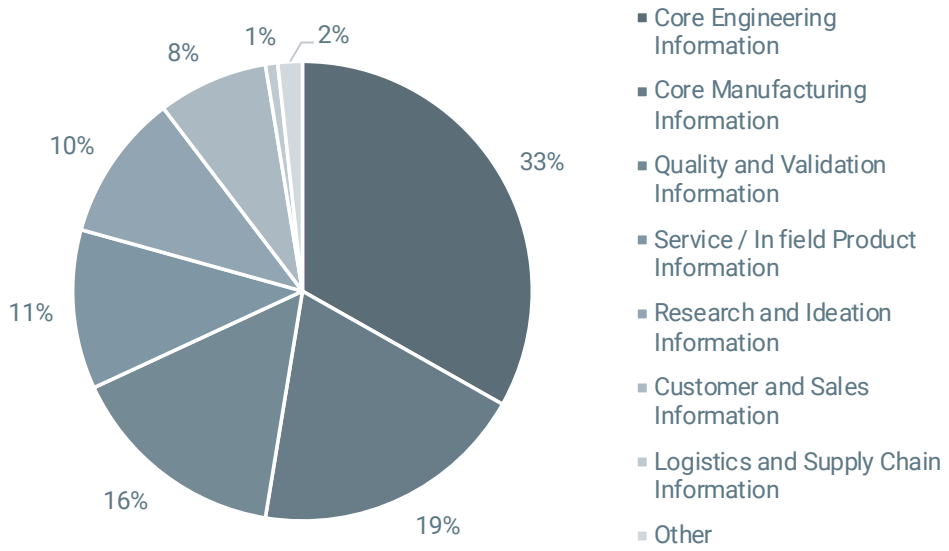


Figure 6: What information does your PLM System Contain?

Notes
1. Engineering functions are defined as Engineering R&D, Manufacturing and Quality

What best describes the usability of your PLM system?

The usability of PLM is often seen as the main barrier for wider adoption in an organisation, especially if significant investment in training is needed to enable its productive usage.

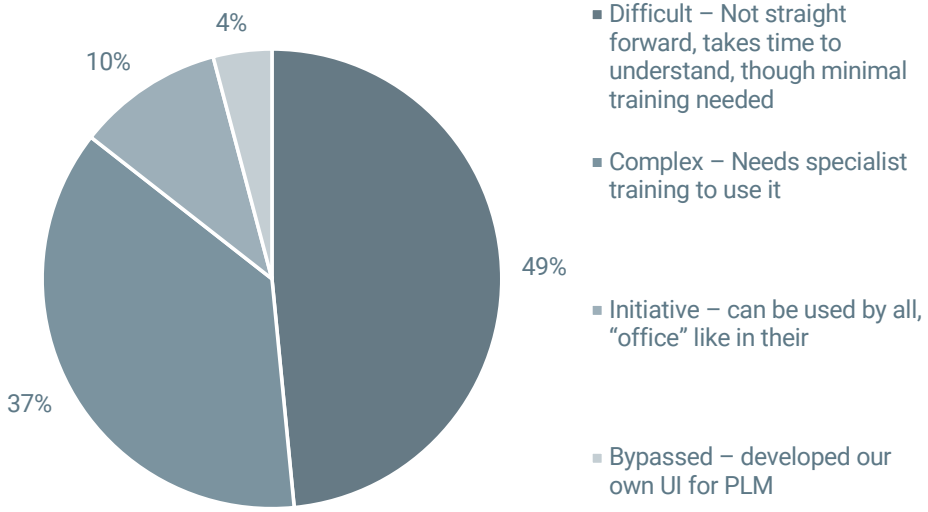


Figure 7: What best describes the usability of your PLM system?

Key Findings

- 49% of respondents believe their PLM system is difficult to use and it takes time to understand.
- In addition, 37% of respondent have specified that their PLM system is "Complex" and requires specialist training.
- 4% of respondents have by-passed the vendors UI with their own developments.

Conclusions

- Since training is required in 86% of the responses, we can conclude that PLM vendors still have not managed to develop a straightforward, user friendly interface.
- PLM's usability is a clear barrier to wider adoption.
- The time to understand the PLM system needs to be considered when implementing. An initial efficiency loss needs to be factored into any ROI calculations due to training and adoption curves.
- Since 4% of respondents have developed their own UI, it would be interesting to understand what was their rationale and what were the benefits.
- The paradox is that 96% of companies still stick with the vendor UI's even if it is complicated. This implies that developing your own UI is both complex and expensive (short and long term).

How is the information inside of PLM mainly accessed in your company?

PLM can store and process large quantities of information, but that information is meaningless if it can not be accessed by users and applications.

Key Findings

- 53% of respondents have indicated that they only access their data through solutions provided by the vendors.
- 17% of respondents have integrated ERP with PLM systems and access through ERP.
- In 15% of cases, prints and offline spreadsheets are still the preferred way to consume PLM information.
- 13% of companies have developed in-house apps.

Conclusions

- Although prints and offline spreadsheets are slowly phased out, it is concerning that in 2017, 15% of the respondents still indicate they are mainly using these off-line tools.
- Despite the complexity of the PLM tool usability (see previous section), the majority of users still mainly use the tools and solutions provided by the vendors. With the usability challenges, it can be inferred that it is still more cost efficient to use the vendor UI rather than developing your own to increase usability.

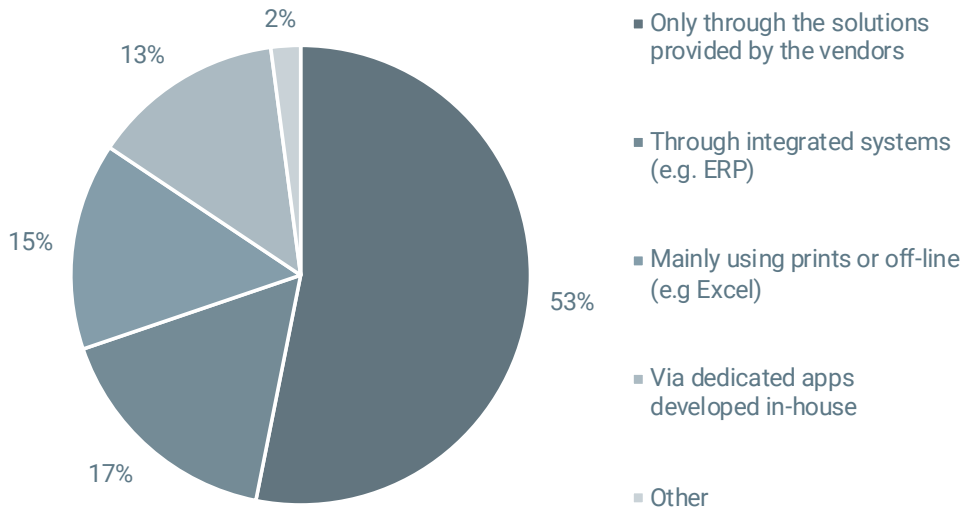


Figure 8: How is the information inside of PLM mainly accessed in your company?

The value case behind PLM

Is the value case behind PLM clear and tangible for many organisations?

5

SUMMARY OF FINDINGS

The conclusions show that PLM business cases are typically intangible and focused on cost reduction. New licensing models are warmly received in industry, yet the adoption of cloud is low.

Is the value case behind PLM clear and tangible for many organisations?

state that the **ROI is intangible** or projects are "**must do with no ROI case**"

indicate the **subscription models** are "**important**" or "**must have**"

Being able to **quantify the benefits of PLM** is key for its wider adoption

of **benefits** are **focused** on **cost reduction**

have **adopted cloud** as a **platform** for **PLM**

Which best describes the ROI for your investments in PLM?

As PLM is a significant investment in most organisations, it is important to have a clearly defined Return on Investment (ROI) which is tangible and measurable.

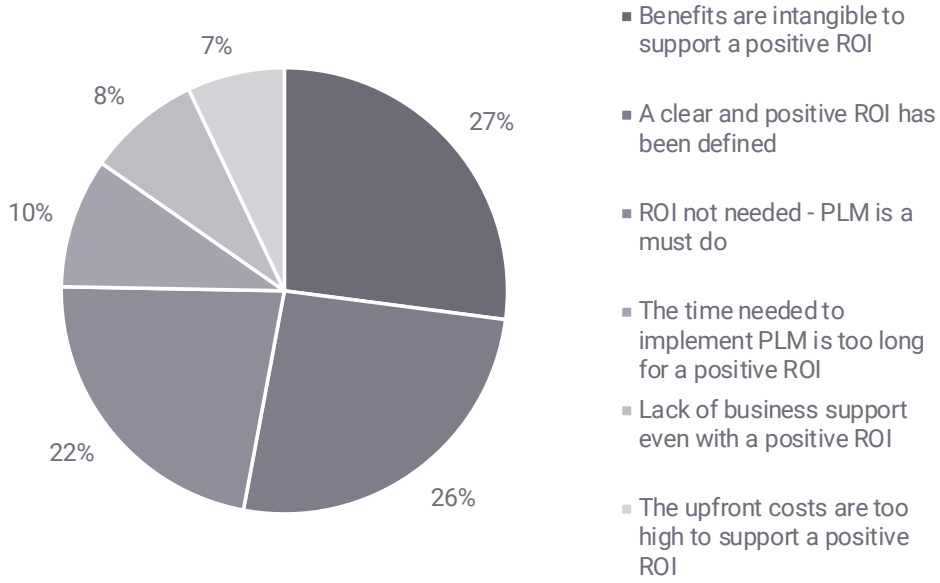


Figure 9: Which best describes the ROI for your investments in PLM?

Key Findings

- 27% of respondents believe PLM benefits are intangible.
- 22% of respondents do not require a ROI to implement the PLM system.
- 26% of companies report a clearly defined and positive ROI before implementing their PLM system.
- 8% of respondents are not supported by the organisation even if the ROI is positive.

Conclusions

- 66% of respondents are making PLM investments based on no ROI defined in their business case
- The investment profile for PLM with either long-term implementation or high-up front costs still prevent positive ROI's. It can be inferred that new vendor solutions such as "cloud" and "subscription" license models seem to be having limited impact[1].
- For the "must do" projects, it should be explored further which business factors drive this investment without a business case.
- In the case of the 8%, when positive ROI lacks business support, is it the usability of PLM? Or is it unclear business ownership or resistance to change of current processes? that drives the low support levels. This is explored later in this report.

Notes

1. With cloud solution, it can be assumed that large infrastructure costs and implementation times can be significant reduced. With subscription models, the initial investment of software licenses can now be spread over the lifetime of the solution.

How are the benefits from PLM seen in your organisation?

For PLM to be seen as a valuable business solution, it must be perceived to add value in an organisation, not just take costs out, especially in IT.

Key Findings

- 58% of respondents state that although benefits are observed, including reduction to non-IT costs, they are intangible or difficult to measure
- 25% of respondents believe PLM can support increased revenue streams and new business models.
- 9% of respondents believe benefits come from IT-related cost savings.

Conclusions

- Cost reduction of non-IT expenditures is the most common benefit, as described by 66% of respondents. The majority of them believe the benefits are intangible and difficult to measure.
- 25% using PLM to support new revenues and business models needs to be explored in future surveys. To drive this further, it is believed that wide business use and information scope of PLM needs to be expanded beyond Engineering functions.
- Efficiency is the primary driver behind the decision to implement PLM. Curiously though, the efficiency increase is presumed and not demonstrated.
- Based on the responses, PLM is focused on driving costs out for the business, with only 9% reporting the focus in cost-downs in IT.

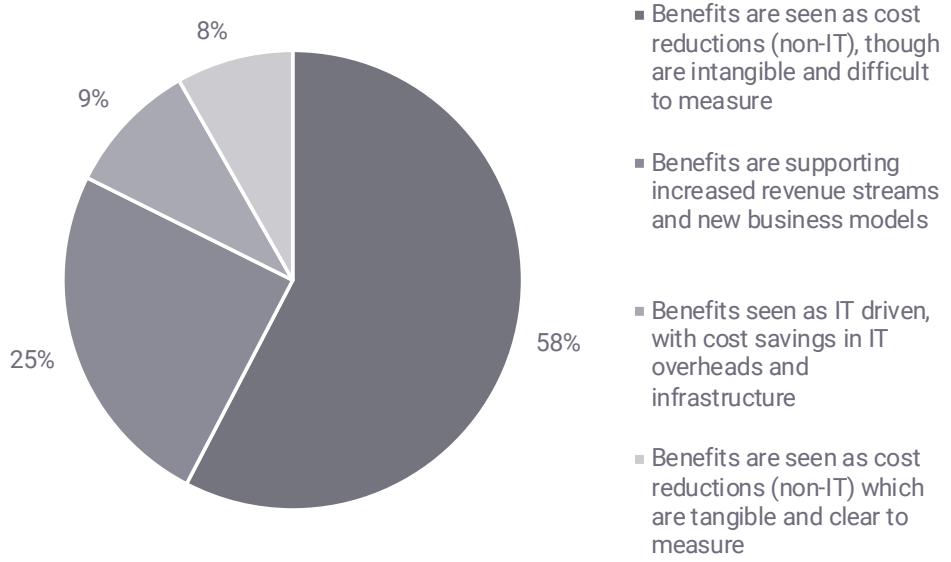


Figure 10: How are the benefits from PLM seen in your organisation?

What are the most attractive features of a licensing model you would like to see?

PLM licensing is usually complex and can sometimes restrict an organization's ability to fully use its PLM system in a cost-effective manner impacting the overall realised ROI of projects

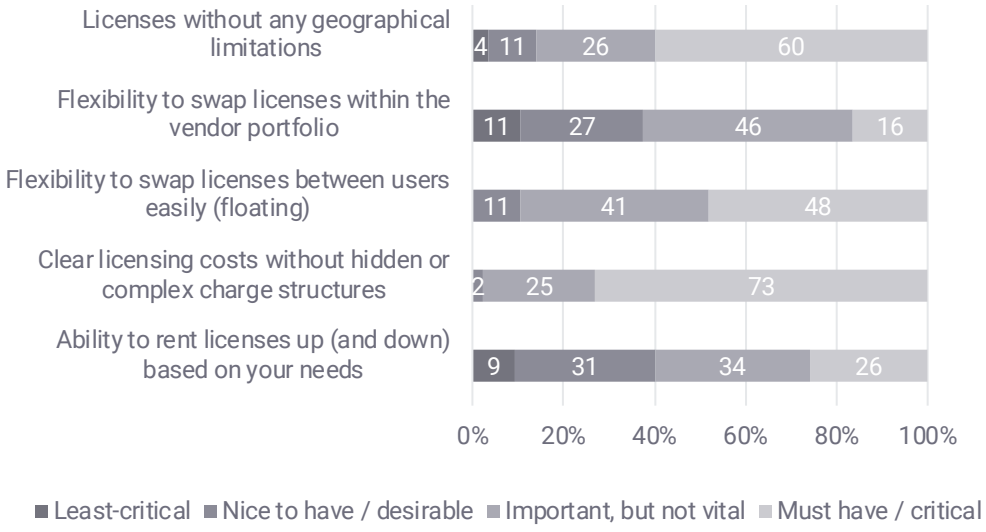


Figure 11: What are the most attractive features of a licensing model you would like to see? [1]

Key Findings

- Lack of geographical limitation is critical for 60% of the companies.
- Clear licensing costs and the ability to use floating licenses is also seen critical for 60.5% of the respondents.
- Additional 46% see as important the ability to swap licenses within the vendor portfolio.
- License rental is seen as important or critical by a majority (60%) of respondents.

Conclusions

- Geographical limitations of licenses are, understandably, major issues for global companies.
- Clear licensing costs allow companies to better plan their expenses, removing unwanted "surprises". It is interesting to understand how this issue evolved from the PLM vendors' point of view.
- Floating licenses allow for efficient use of a license, therefore being critical for most companies.

Notes
1. Values in %'age

Is PLM “in the cloud” seen as a viable option in your business?

The promise of secure, reliable and resilient cloud solutions should allow business to minimise the significant initial investment in infrastructure needed to support on premise PLM solutions.

Key Findings

- Most concerns are security-related, with 43% of respondents citing this as the main issue,
- 20% of respondents see cost as the major blocking point, including the ongoing subscription cost.
- 16% of respondents reject PLM in the cloud altogether, due to the need to control the entire environment in-house.

Conclusions

- Companies seem to be open to migrating their data to the cloud, with only 16% being completely opposed to the idea.
- The most prevalent concern is security.
- 20% of respondents see PLM in the cloud as a more expensive option than in-house, specifying both migration and ongoing costs. Assuming that the move is being made between instances of the same PLM software, could this mean that PLM vendors should put more effort in making sure migrations are pain-free?
- It is worth understanding what companies need to control their PLM system in-house.

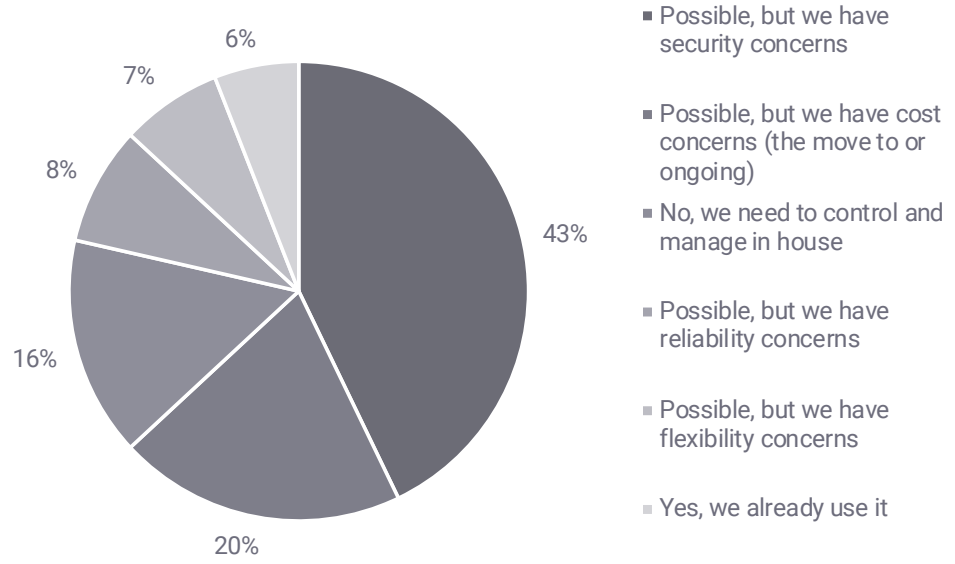


Figure 12: Is PLM “in the cloud” seen as a viable option in your business?

Organisational Readiness for PLM

Are organisations ready to elevate and refine the role of PLM?

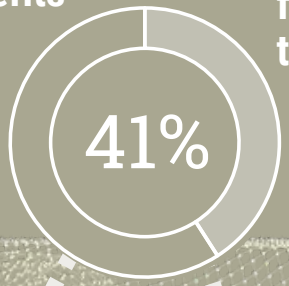
6

SUMMARY OF FINDINGS

The conclusions show that the organizational readiness to elevate the role of PLM is low due to a lack of clear ownership, resulting in resistance and barriers to change, especially to current processes

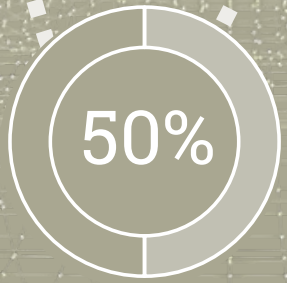
What is the readiness of organisations to elevate and refine the role of PLM?

Are faced with **high resistance to process changes** or **focused** on **localised benefits**

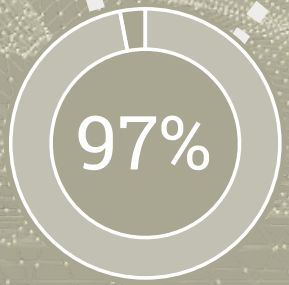


of PLM Programme **focus** is around **cross-function process transformation**

There is **lack** of **Organisational ownership** to elevate the role of PLM to realise its value potential



of PLM has **mixed** or **unclear ownership** of PLM in their business



describe having **siloed processes** as a moderate or very **big barrier** to maximise benefits

How would you best describe the acceptance of your PLM Projects?

Business acceptance on the need for change is critical for the project's success. This is true for any change within an Organisation.

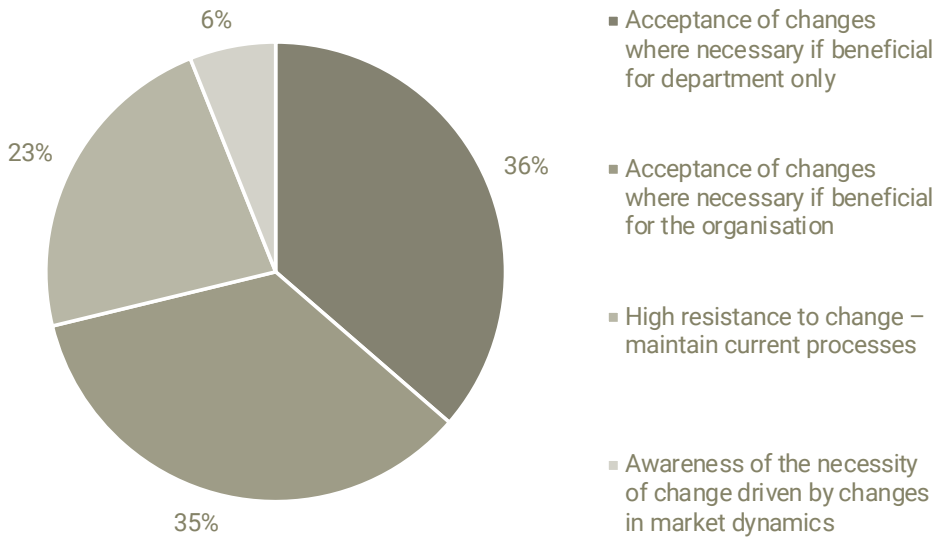


Figure 13: How would you best describe the acceptance of your PLM Projects?

Key Findings

- 35% of organisations have accepted the change, provided it was beneficial for the organisation.
- 36% of respondents say change has been accepted if it supported the department implementing PLM.
- 23% of companies have largely rejected the change.

Conclusions

- The balance between only accepting changes locally verses accepting changes for the wider business at local level is finely balanced.
- This resistance could be due to the way departments are measured in their performance and not to their contribution to overall business results.
- The high resistance to change due to wishing to maintain current processes and ways of working is human nature. Why fix something that is not broken. Given in the previous section we have seen that PLM benefits are often intangible, it is often hard to see how things could be better if improvement can not be defined and measured.
- Acknowledging that changes are often easier said than done, organisations must embrace a flexible culture and use agile implementation approaches to prove, pilot and ramp up.

What is the level of clarity of PLM ownership within your organisation?

The ownership of PLM has traditionally been held in engineering or IT departments of an organisation; however, to drive wider change, executive ownership is needed.

Key Findings

- 20% of respondents believe IT owns PLM.
- 20% of respondents believe PLM is owned by multiple departments with a central governance.
- 18% of respondents assign PLM ownership to a departmental manager

Conclusions

- The equal distribution of answers suggests PLM ownership varies across companies and not common view ownership.
- Only 11% of companies reported Executive ownership with functional accountability. This demonstrates the legacy of departmental ownership and usage of PLM in businesses (typically Engineering). This also indicates that PLM has yet to establish itself as a business critical enterprise application along side ERP and CRM.
- A significant proposition of responses show that PLM is owned by IT and as a consequence PLM is still seen as only an IT tool.
  Like any other IT initiative, PLM must be aligned to organisational strategies to gain benefits. PLM ownership must be held centrally and function in partnership with the business.

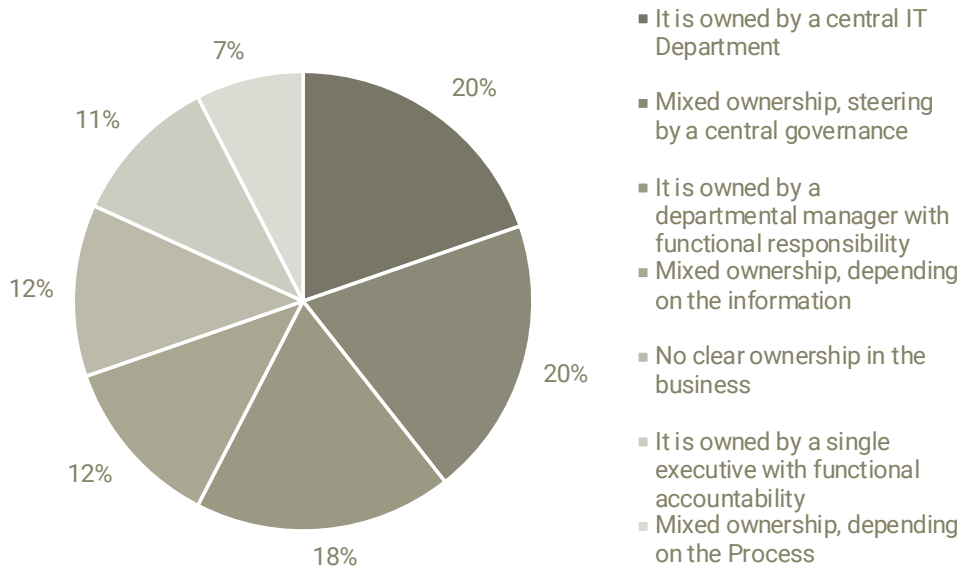


Figure 14: What is the level of clarity of PLM ownership within your organisation?

What is the main focus of your PLM Programme?

The historical focus of PLM projects has been around the reduction of cost, either IT or the business; but for PLM to maximise its potential it needs to be creating value inside of an organisation.

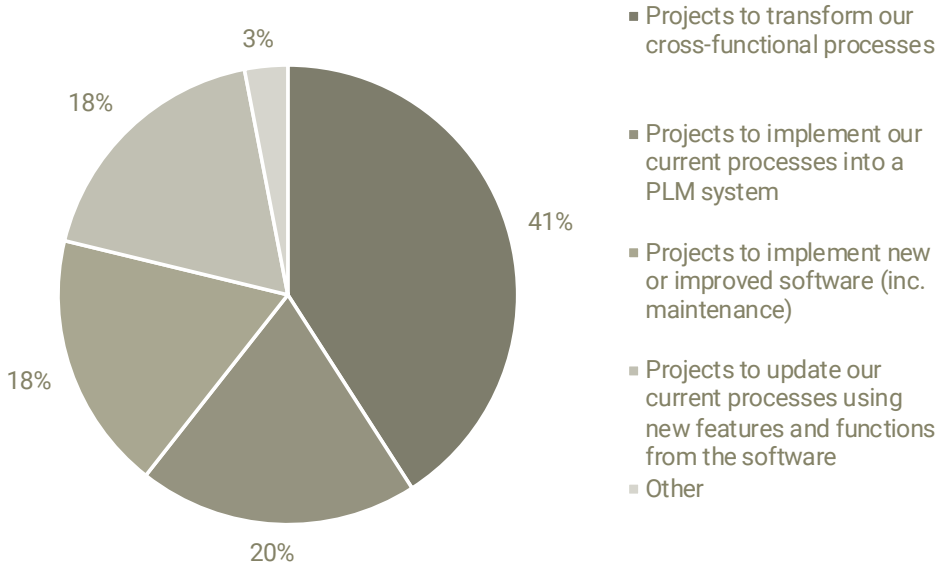


Figure 15: What is the main focus of your PLM Programme?

Key Findings

- 41% of PLM programmes aim to transform cross-functional processes
- 20% of the organisations are currently focusing on implementing their current processes in PLM
- 36% focus on software maintenance projects or implementing new features and functions from the software

Conclusions

- There is a duplicity between the focus of PLM projects being cross-functional transformations and 59% of responses stating resistance to change being high if processes are change or benefits are not departmental (Page 30).
- Given the aforementioned resistance to changes, it is not surprising that 20% of projects are focused on implementing current processes into PLM systems. This does limit the potential of increased benefits through process changes optimised by application capabilities.

What do you see are the greatest barriers for PLM to deliver the maximum benefits in your organisation?

Organisational complexities and legacy ways of working could be seen as the greatest barrier to change, which may in turn limit PLM's value to business.

Key Findings

- 88% of PLM programmes are highly impacted by resistance to change.
- 71% implementations are impacted by focus on other change programmes having more business focus and priorities.
- Only 36% ignore the fact that seeing PLM as an IT tool prevents it from delivering benefits.
- 97% are impacted by the siloed business processes that are not cross functional.

Conclusions

- Resistance to change is a common roadblock to organisational transformation. Organisations must establish and adopt flexible culture and be ready sell the benefits of change to business owners.
- Siloed business process present a major barrier for delivering maximum benefits. However, as seen previously[2], most companies with siloed business processes have started a consolidation process using PLM.

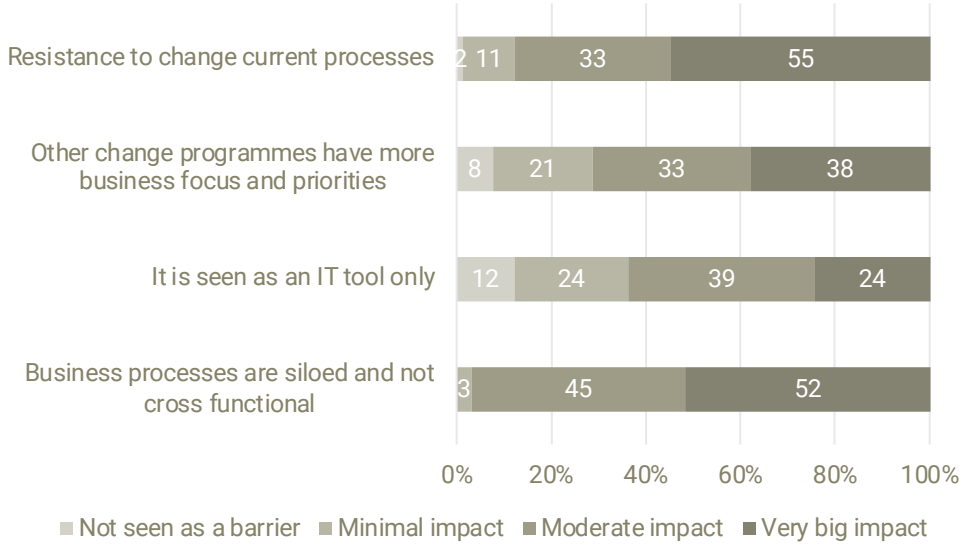


Figure 16: How are the benefits from PLM seen in your organisation?[1]

Notes
1. Values in %'age
2. 41% of PLM programmes aim to transform cross-functional processes Link to survey question

Driving value from PLM Information

Are organisations able to extract value from PLM information through insight and analytics?

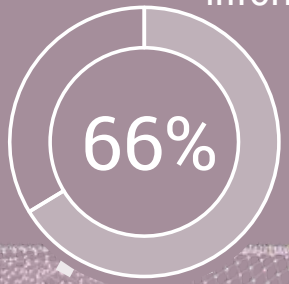
7

SUMMARY OF FINDINGS

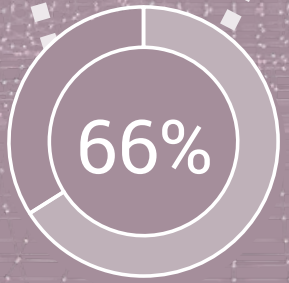
The conclusions show that whilst tools to analyse PLM information are available from the vendors, most companies export information offline and the maturity of PLM reporting tools is low.

Are organisations able to extract value from PLM information through insight and analytics?

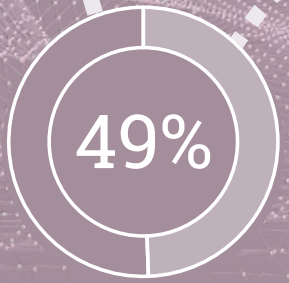
are **unable to access PLM** or **need to export** the information to analyse it



companies use **no or basic KPI's** from PLM information



state that **PLM vendors provide tools** to access PLM information



do not use the vendor applications to access the data

To increase the value from PLM we **need further access and** analysis to maximize the potential

Can you access your PLM data to analyse it?

Being able to access the information in PLM through trusted and reliable mechanisms will help organisations realise its value.

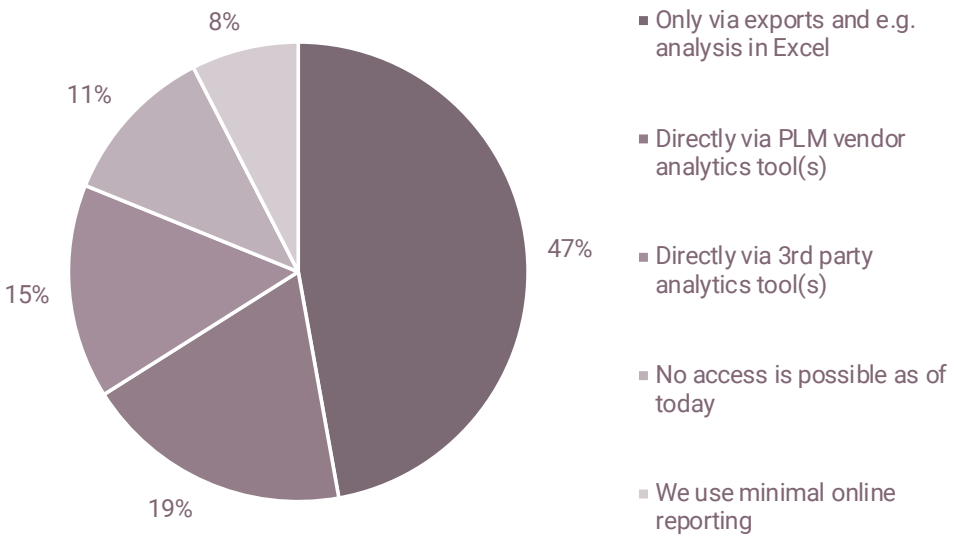


Figure 17: Can you access your PLM data to analyse it?

Key Findings

- 47% of respondents export to Excel to analyze their PLM data.
- 19% use data analytic tools provided by PLM vendors
- 11% of respondents do not use PLM data for analysis due to no access.
- 15% use 3rd Party analytics tools.

Conclusions

- Although PLM vendors provide data analytics tools, only 19% are able to use it. A vast majority still use Excel defeating the idea of a single source of truth, increasing operational complexity and developing silos.
- Data is useless when it cannot be processed. PLM tools must have inbuilt reporting capabilities or integrate with third party analytics tools to utilize data contained in PLM system to bring value to its users.

Does your PLM vendor provide the access and tools to analyse PLM information?

To get to the valuable information inside of PLM, the vendors need to supply simple and intuitive ways both to access and visualise this data in a trusted and secure way.

Key Findings

- 53% of respondents state that, while tools are available, access is still complex.
- 13% of respondents lack tools to extract data from their PLM system.
- 13% of respondents can easily access the data even without vendor-provided tools
- 10% of companies cannot access the PLM data

Conclusions

- Since a majority of companies have difficulty accessing their PLM data with vendor-provided tools, it is interesting to explore the evolution of PLM interfaces.
- We should try to understand how PLM data is used in the organisations where it cannot be accessed.

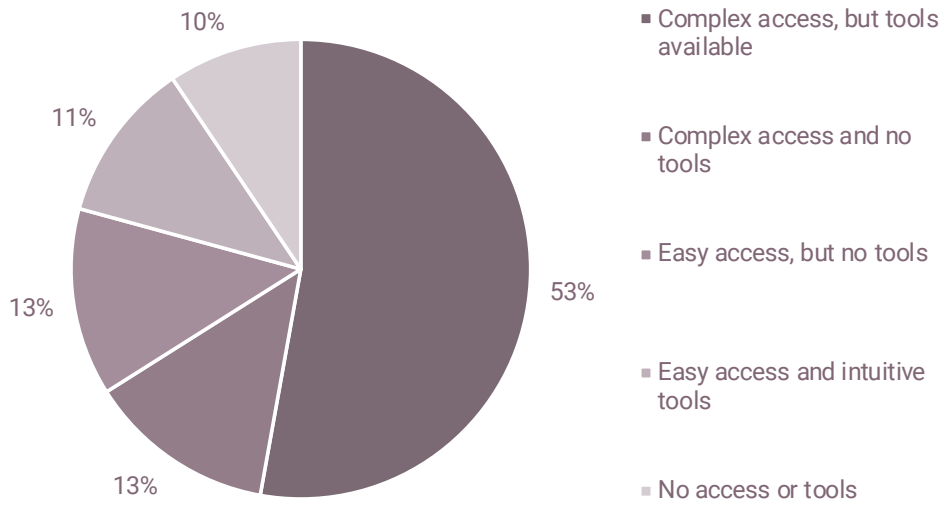


Figure 18: Does your PLM vendor provide the access and tools to analyse PLM information?

What are the main measures and KPIs you take from PLM?

The maturity in the way businesses use information from PLM is directly related to the value that they can return from the system

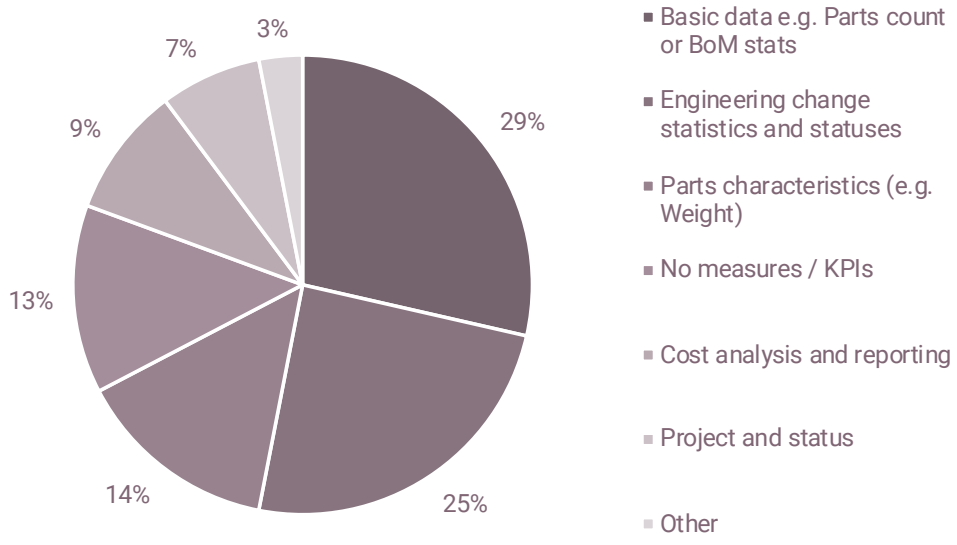


Figure 19: What are the main measures and KPIs you take from PLM?

Key Findings

- 29% of respondents report basic product information.
- 25% of companies extract information about engineering changes.
- 14% report component characteristics
- 13% of respondents do not extract any KPIs from the PLM system

Conclusions

- Reporting basic product information under-utilises the capabilities of PLM. Organisations must explore key Product Information like quality, services, cost analysis to benefit their customers.
- It is interesting to understand whether this low utilisation of the available data in PLM is due to difficulty of access, or to the company not understanding what possibilities PLM offers.
- Since only 14% of respondents extract part characteristics from PLM, we can conclude that for 86% of respondents there is additional value that can be extracted from their existing PLM systems, with relatively low investment.

Does your company's Big Data strategy have connections to PLM?

If PLM should be the source of a companies product information and knowledge, it is logical that PLM should be connected to a companies "Big Data" strategy.

Key Findings

- In 24% of the answers, the company's Big Data strategy disregards PLM.
- 36% of companies do not have formal Big Data strategies.
- 25% of companies plan to include PLM in their strategy.
- Only 15% of companies already consider PLM when planning their Big Data approach.

Conclusions

- Since only 24% of respondents disregard PLM in their Big Data approach, we can assume that PLM is slowly being seen as more than an Engineering-only tool.
- For the companies that include PLM in their strategy, it is interesting to further explore what is its place – what data is captured and how is it being used.

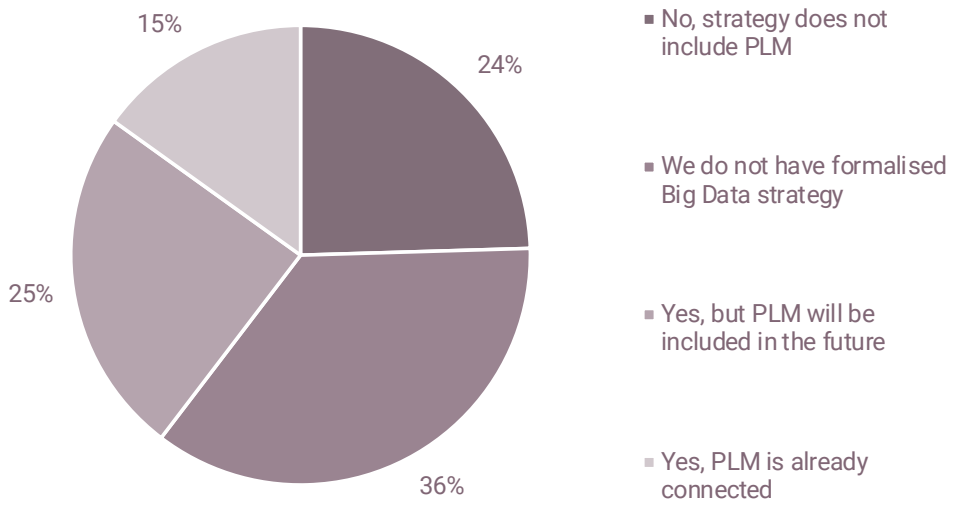
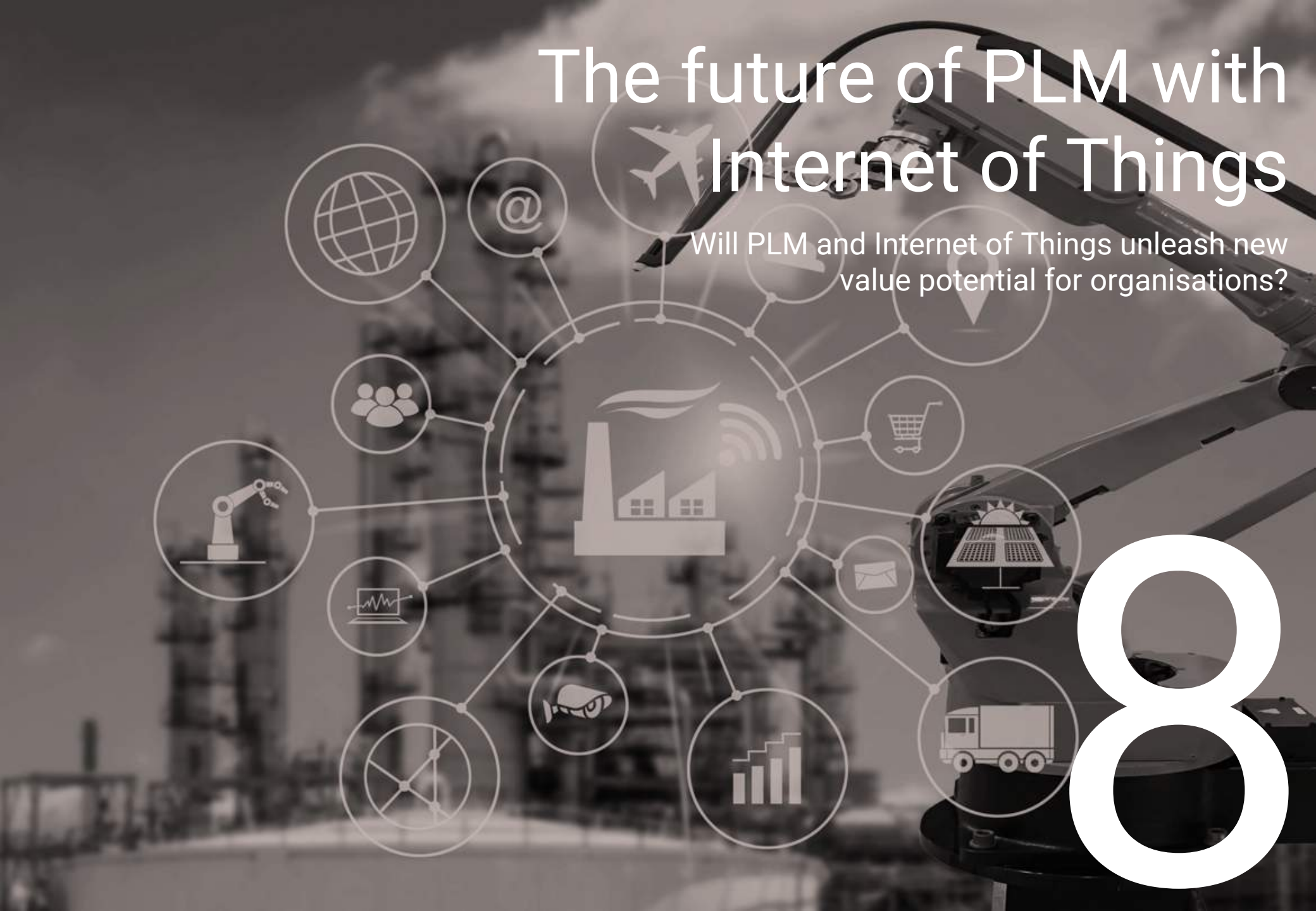


Figure 20: Does your company's Big Data strategy have connections to PLM?



The future of PLM with Internet of Things

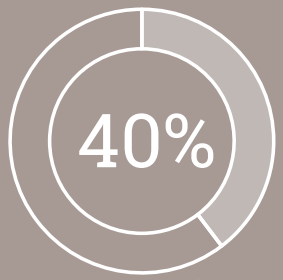
Will PLM and Internet of Things unleash new value potential for organisations?

8

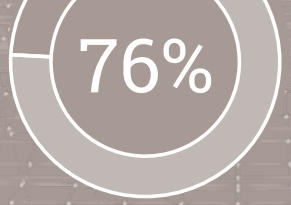
SUMMARY OF FINDINGS

The conclusions show that beyond the PLM and IoT hype many organisations are not ready to incorporate PLM into their digital strategy due to a lack of clarity of PLM's role in an organisation.

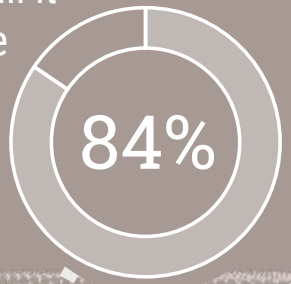
Will PLM and Internet of Things unleash new value potential for organisations?



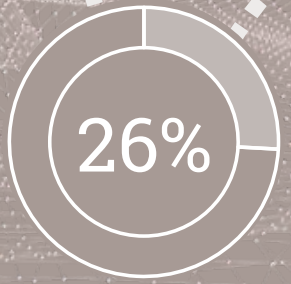
PLM is not included in their digital strategy nor will it be in the future



PLM implementation is not ready to support IoT and either have no or long term plans to change



Clarity of PLM role vs other systems being a key barrier for PLM to enable IoT initiatives



New buzz-words for PLM are helping redefine PLM's role in the Organisation

PLM's role needs further clarity to fully support IoT in the future

Has your company made PLM an integral part of its Digital strategy?

Product and product information is normally core to a company's digital strategy and the need to have PLM connected to the strategy should be key for its realisation.

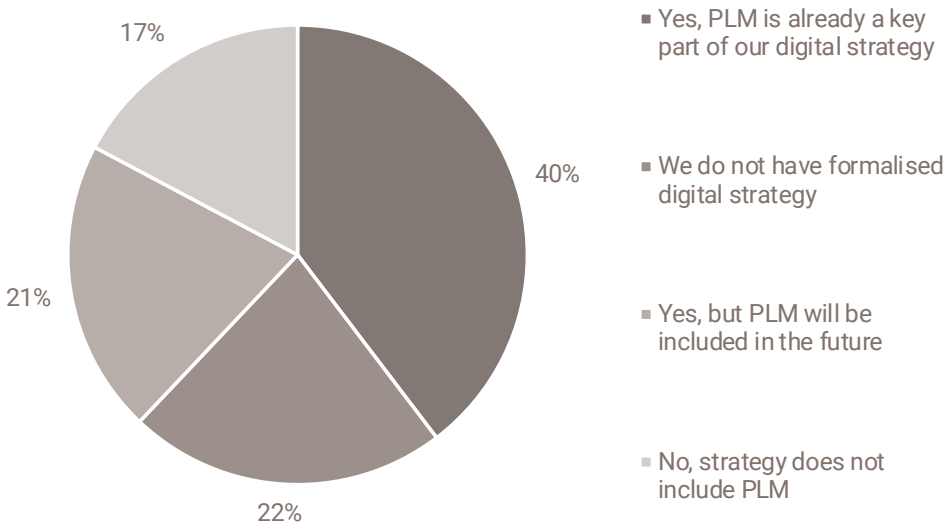


Figure 21: Has your company made PLM an integral part of its Digital strategy?

Key Findings

- 40% of respondents state PLM is currently a key part of their digital strategy.
- 22% of respondents do not yet have a digital strategy.
- Although PLM is part of their digital strategy, it will be included in the future say 21% of respondents.
- PLM is not a part of digital strategy in 17% of cases.

Conclusions

- The fact PLM is part of their digital strategy in 61% of companies means PLM is viewed as an enabler for digitalisation.
- Major research by Management Consultancies indicate that digital is recognised by executives as key for business survival (not growth) for the next 5 years.
  Yet 22% of the responses received state they have no formalised digital strategy and a further 17% have not included PLM in it.

To what extent do you see your PLM implementation ready to support IoT for connected products?

If the “T” in Internet of Things is the ”P” in PLM, then businesses use of PLM in the execution of their IoT strategy should be a priority

Key Findings

- PLM implementation is not ready to support IoT with 30% of respondents. However, in the long term this is expected to change.
- 29% point out that their PLM implementation is not ready to support IoT and there is no plan to change in the near term.
- Their PLM implementation will be changed in near term to support IoT while currently it does not, say 17% of respondents.
- 17% indicate that their PLM Implementation does not take IoT into consideration.

Conclusions

- 65% of organisations understand there is a deficit in the maturity of their PLM implementation to support IoT.
- Both organisations and service providers alike must primarily concentrate their efforts to overhaul their current PLM to support IoT by analyzing and reducing gaps.
- PLM vendors and service providers must play a major role to educate organisations to prepare their PLM for IoT. To realize their IoT goals in short span organisations can use agile methodology to set up working prototypes, pilot and ramp up.
- IoT vendors have been pushing its adoption over the last years, with moderate success up to the level of Proofs of Concept and Pilot projects. However, full use in Production is far from achievable. The fact that only 7% of respondents have their PLM system ready, can give a good explanation why.

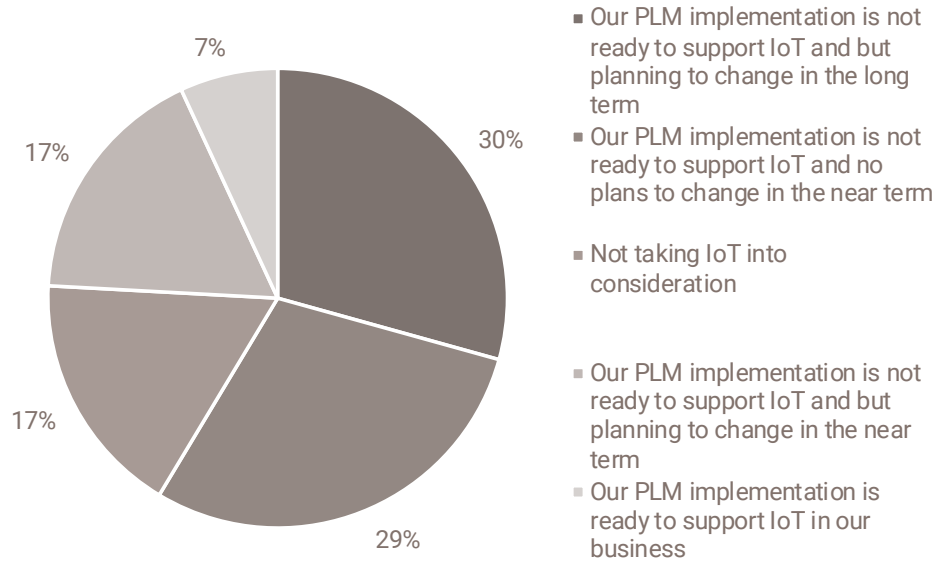


Figure 22: To what extent do you see your PLM implementation ready to support IoT for connected products?

What are the biggest barrier you see for PLM enabling your IoT initiatives?

The "engineering" legacy of PLM and its complexities could be seen as a barrier to enabling IoT initiatives with critical product information

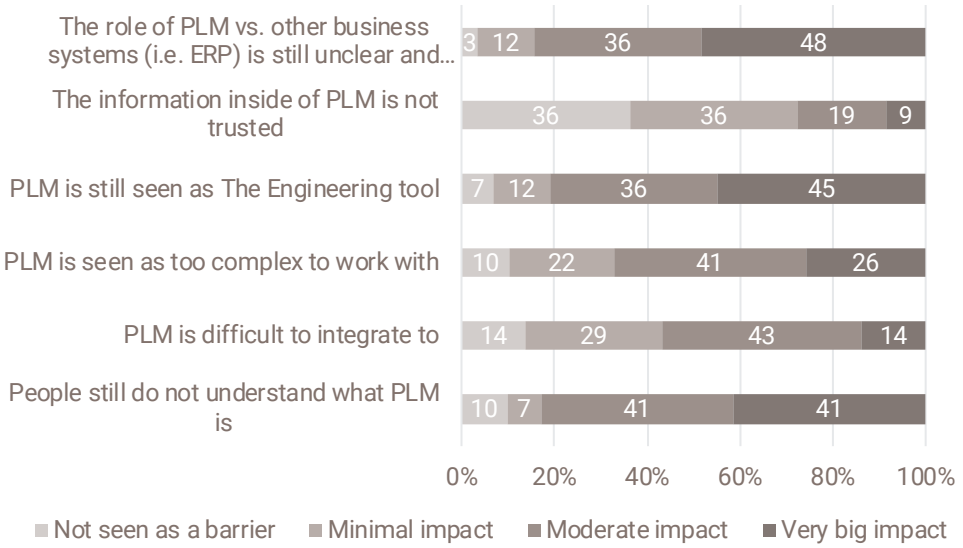


Figure 23: What are the biggest barrier you see for PLM enabling your IoT initiatives?[1]

Key Findings

- 84% of respondents attribute the unclear role of PLM, as opposed to other business systems, to having a moderate to very big impact in using PLM as an enabler for their IoT initiatives.
- 45% agree that PLM is seen as the Engineering tool has a Very big impact.
- The fact that people still do not understand what PLM is has 82% impact on creating a barrier to act as an enabler for their IoT initiatives.
- 67% of respondents indicate PLM is seen as too complex to work with.

Conclusions

- Its alarming that after 30 years of its inception, majority of organisations do not understand the role of PLM. This could be due to the majority of PLM organisations have not yet progress from Product Data Management (PDM) implementations. This indicates a need to showcase the potential and value of PLM.
- 81% indicate that PLM is still seen as an Engineering tool. This perception must change as PLM can bring value only when it is used through out the product's lifecycle which is much broader than Engineering.
- PLM vendors must focus on user experience to gain acceptance.

Notes
1. Values in %'age

To what extent do you believe new terms surrounding PLM like IoT, Digital Twin and Big Data in helping PLM's positioning in your company?

The combination of the hype around PLM and IoT and a new vocabulary to describe concepts may be causing further confusion in the role of PLM for organisations.

Key Findings

- 43% of respondents point out that the new terms surrounding PLM is causing confusion on the value PLM brings to their Organisation.
- The new terms have not impacted the way PLM is positioned in 31% of companies.
- 21% believe that these terms are helping their companies redefine the role of PLM
- 5% see that the new terms have fundamentally changed the role of PLM and its value to their company.

Conclusions

- Less is more. For a majority of organisations the new terms seem counter-productive. A Body of Knowledge (BOK) could be recommended to define terms, concepts and activities around for digitalisation or industrie 4.0.
- IoT relies on a functioning PLM system, containing accurate and complete data. At the same time, the need for using IoT can enhance PLM's visibility in a company. It is interesting in reality IoT has created confusion rather than clarify PLM's role.

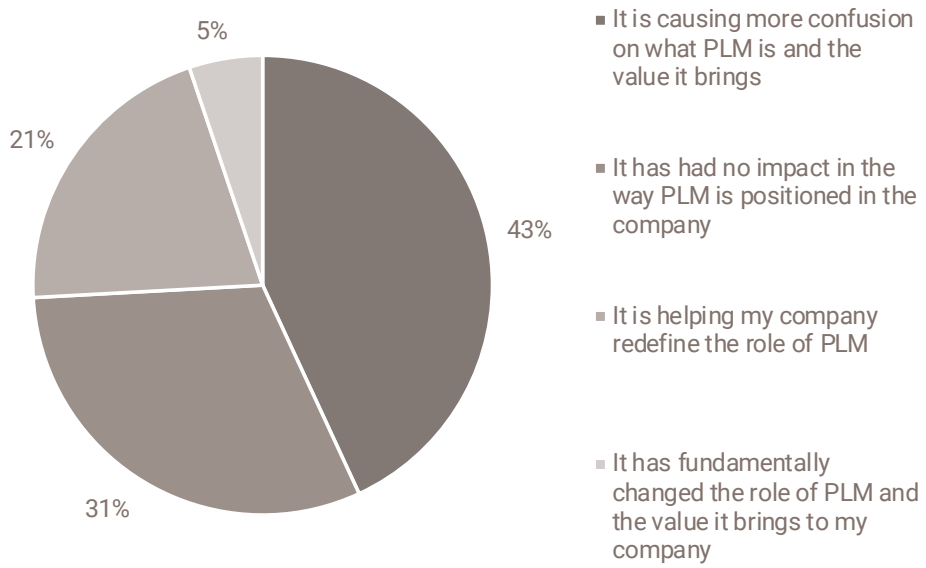


Figure 24: To what extent do you believe new terms surrounding PLM like IoT, Digital Twin and Big Data in helping PLM's positioning in your company?

9

Conclusions and Recommendations

CONCLUSIONS AND RECOMMENDATIONS

Whilst software vendors are promising more cost effective PLM solutions, it is through the wider adoption and information scope across the enterprise which will fundamentally increase the business benefit from PLM

Business use of PLM

Is PLM predominantly used by Engineering functions or is there a wider adoption in organisations?

- The legacy use of PLM is having a detrimental effect of the value potential of PLM investments in an organisation
- Usage of PLM must break out of Engineering functions. This will allow businesses to gain greater value using product information and their historical investments.
- The more information a PLM system contains across the lifecycle of a product, the more value an organisation can gain from PLM and will drive the broader use in a business.
- The usability of PLM is often seen as the main barrier for wider adoption in an organisation, especially if significant investment in training is needed to enable its productive usage.
- PLM can store and process large quantities of information, but that information is meaningless if it can not be accessed by users and applications.

PLM Value Case

Is the value case behind PLM clear and tangible for many organisations?

- As PLM is a significant investment in most organisations, it is important to have a clearly defined Return on Investment (ROI) which is tangible and measurable.
- For PLM to be seen as a valuable business solution, it must be perceived to add value in an organisation, not just take costs out, especially in IT.
- PLM licensing is usually complex and can sometimes restrict an organization's ability to fully use its PLM system in a cost-effective manner impacting the overall realised ROI of projects
- The promise of secure, reliable and resilient cloud solutions should allow business to minimise the significant initial investment in infrastructure needed to support on premise PLM solutions.

"PLM is still seen primarily as an engineering tool"

Anonymous survey comments submitted

"Financing have looked more favorably on Capital costs vs high ongoing Operating costs."

Anonymous survey comments submitted

CONCLUSIONS AND RECOMMENDATIONS

The lack of executive ownership of PLM and the duplicity of a departments acceptance of PLM verses the transformational scope of projects mean many organisations struggle to realise the potential benefits

"An educational PLM programme for the Exec team based around Digital Manufacturing has proved very effective"

Anonymous survey comments submitted

Organisational Readiness

What is the readiness of organisations to elevate and refine the role of PLM?

- Business acceptance on the need for change is critical for the project's success. This is true for any change within an organisation.
- The ownership of PLM has traditionally been held in engineering or IT departments of an organisation; however, to drive wider change, executive ownership is needed.
- The historical focus of PLM projects has been around the reduction of cost, either IT or the business; but for PLM to maximise its potential it needs to be creating value inside of an organisation
- Organisational complexities and legacy ways of working could be seen as the greatest barrier to change, which may in turn limit PLM's value to business.

Value of Information

Are organisations able to extract value from PLM information through insight and analytics?

- Being able to access the information in PLM through trusted and reliable mechanisms will help organisations realise its value.
- To get to the valuable information inside of PLM, the vendors need to supply simple and intuitive ways both to access and visualise this data in a trusted and secure way.
- The maturity in the way businesses use information from PLM is directly related to the value that they can return from the system
- PLM should be the source of a companies product information and knowledge, it is logical that PLM should be connected to a companies ”Big Data” strategy.

CONCLUSIONS AND RECOMMENDATIONS

The gap between current PLM initiatives, legacy implementations and the need to ready them for digital capabilities is significant and few companies have managed to effectively integrate their information or applications.

Future of PLM

Will PLM and Internet of Things unleash new value potential for organisations?

- Product and product information is normally core to a company's digital strategy and the need to have PLM connected to the strategy should be key for its realisation.
- If the "T" in Internet of Things is the "P" in PLM, then businesses use of PLM in the execution of their IoT strategy should be a priority – yet few implementations are ready to support
- The "engineering" legacy of PLM and its complexities is seen as a barrier to enabling IoT initiatives with critical product information.
- The combination of the hype around PLM and IoT and a new vocabulary to describe concepts may be causing further confusion in the role of PLM for organisations.

Scope of next surveys

Where could we take the focus of the PLMPulse Surveys in the future?

- How PLM information is used by non-Engineering departments and how they access product information.
- What are the main usability issues seen with PLM applications and what changes would make the biggest difference.
- If security is the biggest concern with cloud, it could be explored why companies believe PLM should be managed in-house.
- Further analysis of business resistance to process changes enabled by PLM should be investigated to better understand the barriers.
- The utilisation of product information in PLM applications and their role in Big Data and Digital Initiatives – Where PLM is part of the strategies, what is its role.
- What changes are needed to legacy PLM implementations to ready them for IoT initiatives. What is the scope of these initiatives.
- What changes to PLM nomenclature and concepts would increase Executive awareness and buy-in.

"The very definition of IoT and the business value it brings is vague and not accepted across the organization"

Anonymous survey comments submitted

Acknowledgements

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ACKNOWLEDGEMENTS

Without the involvement of a number or key individuals and organisations, the development and execution of the PLMPulse Survey would not have been possible.

Steering Committee

The scope and direction for this year's PLMPulse report was steered by a number of persons and companies. The report authors would like to acknowledge the following persons for the valuable input in shaping the PLMPulse Survey for 2017.

- Anton Nanchev – AB SKF
- Björn Axling – Husqvarna
- Mark Hablish – TI Automotive
- Ross Pascoe – Stannah Stairlifts Limited
- Simon Kaufman – Stannah Stairlifts Limited
- Steve Janoo – Dyson Limited

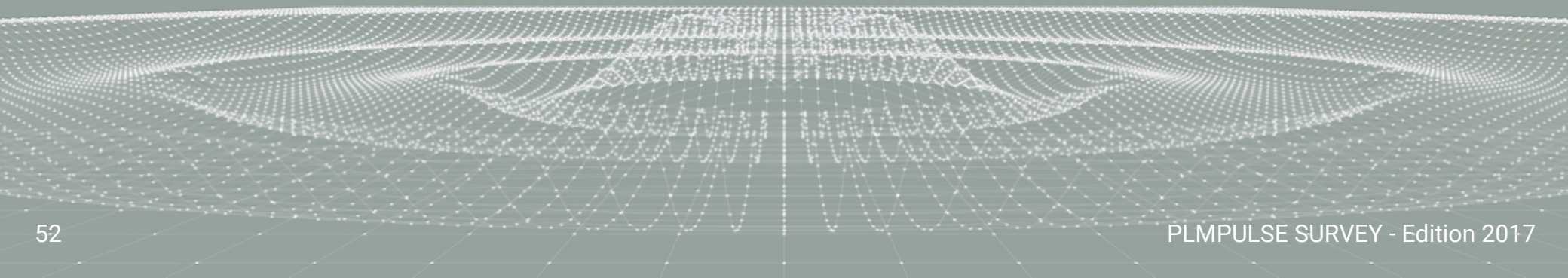
MarketKey Collaboration

The concept for PLMPulse was developed in collaboration with the team and MarketKey Limited, the organisers of the PI PLMx conferences. In particular, the report authors would like to acknowledge the following persons for their support.

- Maeve Sugrue
- Malgorzata Swida
- Paul Empringham

A final thank you

A final thank you must be passed to Stefan Popescu and Gautham Puthran who support has been invaluable in the analysis of the results and the collation of this report.



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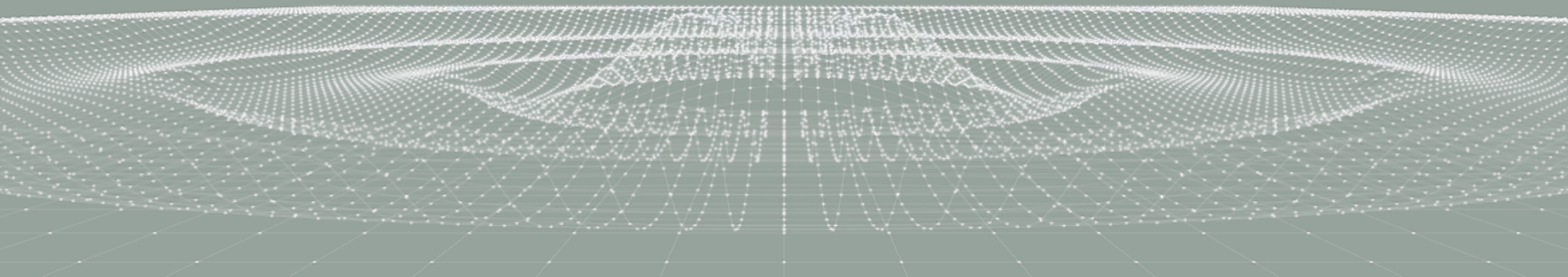
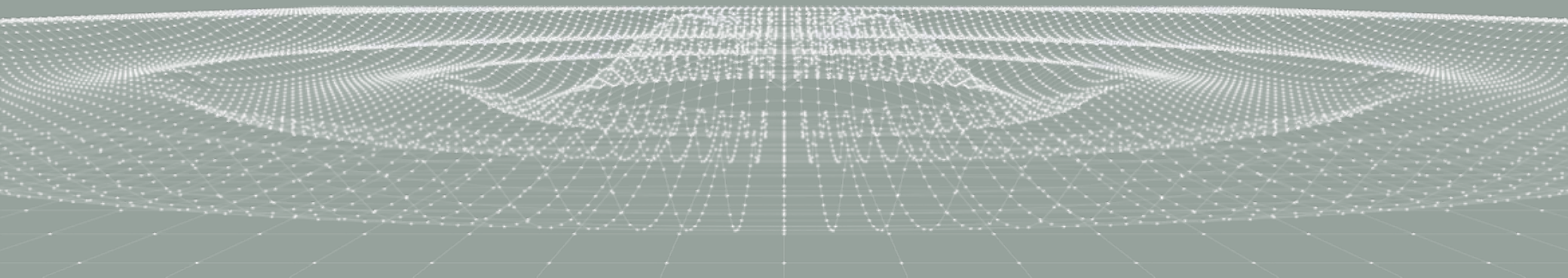


ACRONYM DEFINITIONS

We tried to keep this report in plain English and not use many technical terms. We could not escape them all and below we have listed the acronyms and their definitions.

B2B	BUSINESS TO BUSINESS COMMERCE
B2C	BUSINESS TO CONSUMER COMMERCE
BOK	BODY OF KNOWLEDGE
BOM	BILL OF MATERIALS
CAD	COMPUTER AIDED DESIGN
CRM	CUSTOMER RELATIONSHIP MANAGEMENT
ERP	ENTERPRISE RESOURCE PLANNING
GDP	GROSS DOMESTIC PRODUCT
IOT	INTERNET OF THINGS
IT	INFORMATION TECHNOLOGY
KPI	KEY PERFORMANCE INDICATORS
PDM	PRODUCT DATA MANAGEMENT
PLM	PRODUCT LIFECYCLE MANAGEMENT
POC	PROOF OF CONCEPT
R&D	RESEARCH AND DEVELOPMENT
ROI	RETURN ON INVESTMENT
UI	USER INTERFACE



About i42R B.V.

We are a new, small and agile team of experienced specialists, with the goal to help clients navigate today's complexities of digital transformations in Engineering and Manufacturing. This is often referred to as Industrie 4.0 – a nice concept, but too often the steps to help release the benefits are too confusing, wrapped up in consultants PowerPoints. We aim to change this, bringing to the fore our industry and technical know-how. This, coupled with senior operations management experience and practical experience of defining and executing strategies which materially improve a businesses performance, hopefully will be a winning formula for you.

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About PI PLMx

PI is a CIO-led learning community for manufacturers. Our mission is to provide the CIO, their executive team, as well as future talent, with the network and peer-led knowledge to respond to opportunities and threats in an information-centric World.

PI exists to provide manufacturers a cross-industry network of industry pioneers and like-minded peers. Our purpose is to harness this collective wealth of knowledge to give our members insights to navigate the fast-moving manufacturer landscape, innovate in both product and strategy, and ultimately, create more shareholder and customer value.

To find out more about PI and their events please visit www.pi.tv

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Visit us at: www.plmpulse.com

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Call us on: +31 30 320 00 42