



Agenda



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Looking to the Future



Purpose

- **Future planning** is key for any business
- We **want to assist you with future planning**
- **The Business Advantage Group** is an international market research, data, sales development and consulting practice specializing in the CAD/CAM/CAE/PDM/PLM sectors

Methodology

- **Annual Online survey** in Nov, 2014. Data comparison with Dec, 2013 survey results
- The survey was managed from our offices in London and San Francisco, drawing respondents from our in-house data repository of over 500,000 CAD/CAM users and decision makers and other data sources
- **635 CAD users & decision makers** across a range of company sizes and industries worldwide took part

Get Involved

- **15 Topics** and their perceived **importance, actual and future usage** related to CAD were captured, enabling us to identify **key trends in the CAD sector** now and over the next five years
- **Please take a look at our top line results and let us know if you agree or disagree with our predictions. We would love to hear your thoughts**





Key Topics

15 Key CAD trends were identified for the survey this year compared to 14 Key CAD trends last year, enabling us to do year-on-year comparison

- A series of questions were asked about each of the 15 CAD trends to get a better understanding of Awareness, Perceived Importance, Current Usage and Future Usage

Q. Awareness

Q: Which of the following leading trends are you familiar with or have heard of?

A prompted list was shown and respondents were asked to select all response options that apply

Q. Perceived Importance

Q: Thinking about your core business functions, to what extent do you see each of these as an important trend to your company?

A rating scale of 1 to 10 used, where 1 is not at all important and 10 is extremely important to your company

Q. Current and Future Usage

Q: Thinking about these trends again what do you/your company already use in-house at the moment? and...

...plan on using in-house within the next 12 months?

... plan on using in-house within the next 3-5 years?

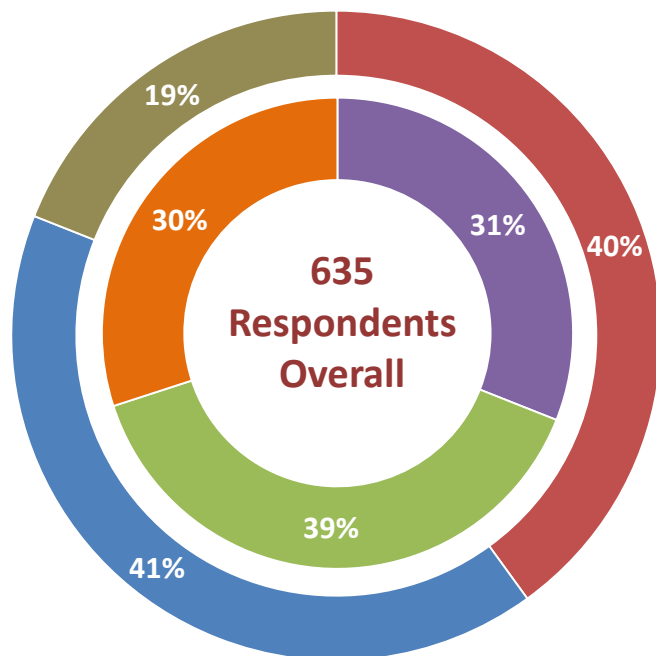




The 2015 Survey Audience N=635

■ EMEA ■ Americas ■ Asia Pacific

■ Small (1) ■ Medium (2) ■ Large (3)

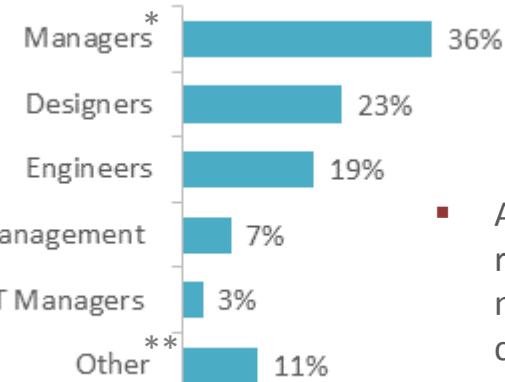


- Even split between EMEA & North America
- 7 in 10 are SMEs

1. Small (up to 50 employees)
2. Medium (50-1,000 employees)
3. Large (over 1,000 employees)

Job Title

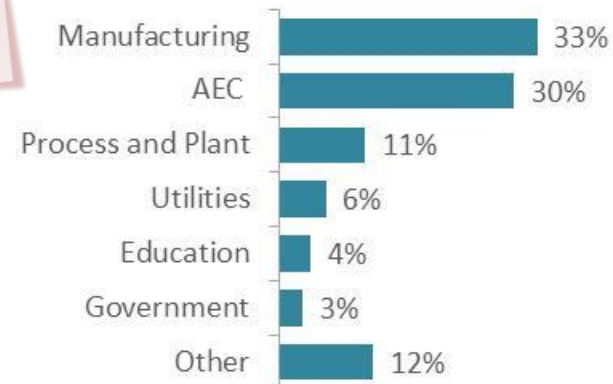
Respondents' Profile



- Around 1 in 3 respondents are managers in their company

* CAD/Eng./Design/Tech./Project.
** Architects and Education related

Sector





Key Trends Overview

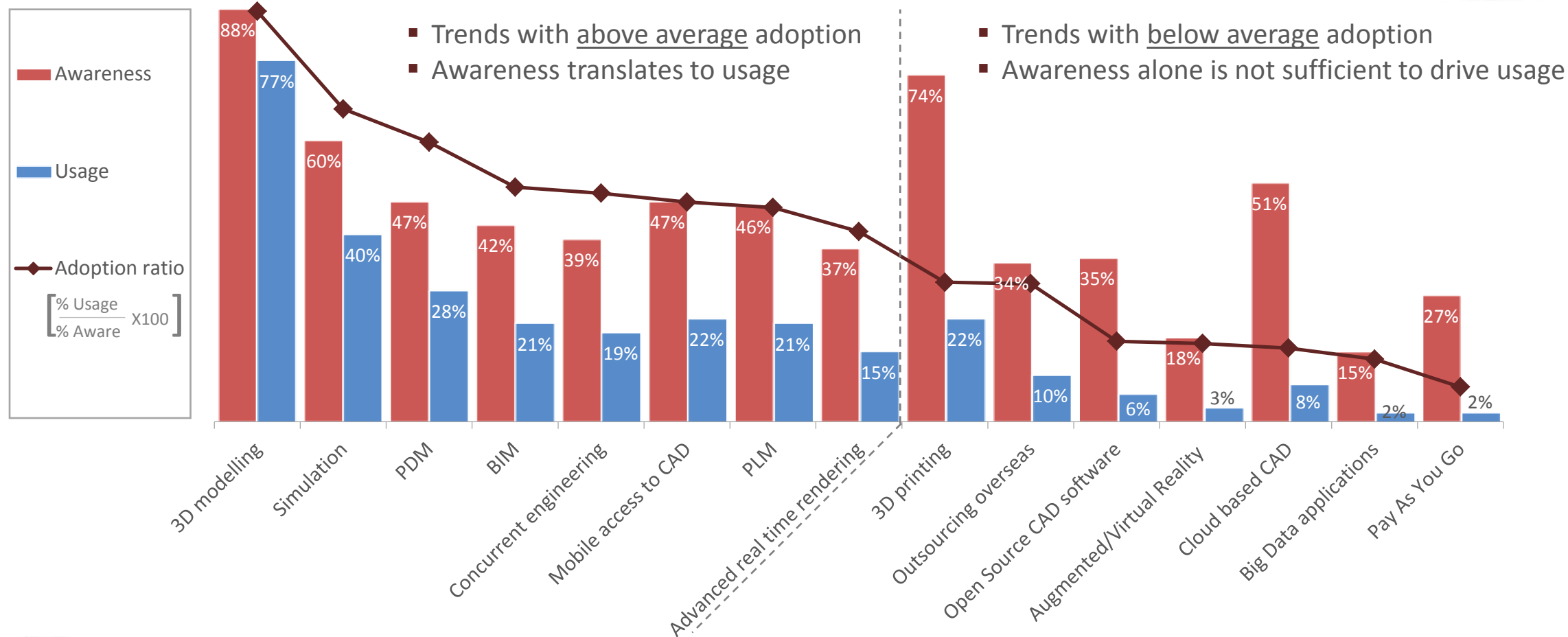
Section One





Current Trends Snapshot

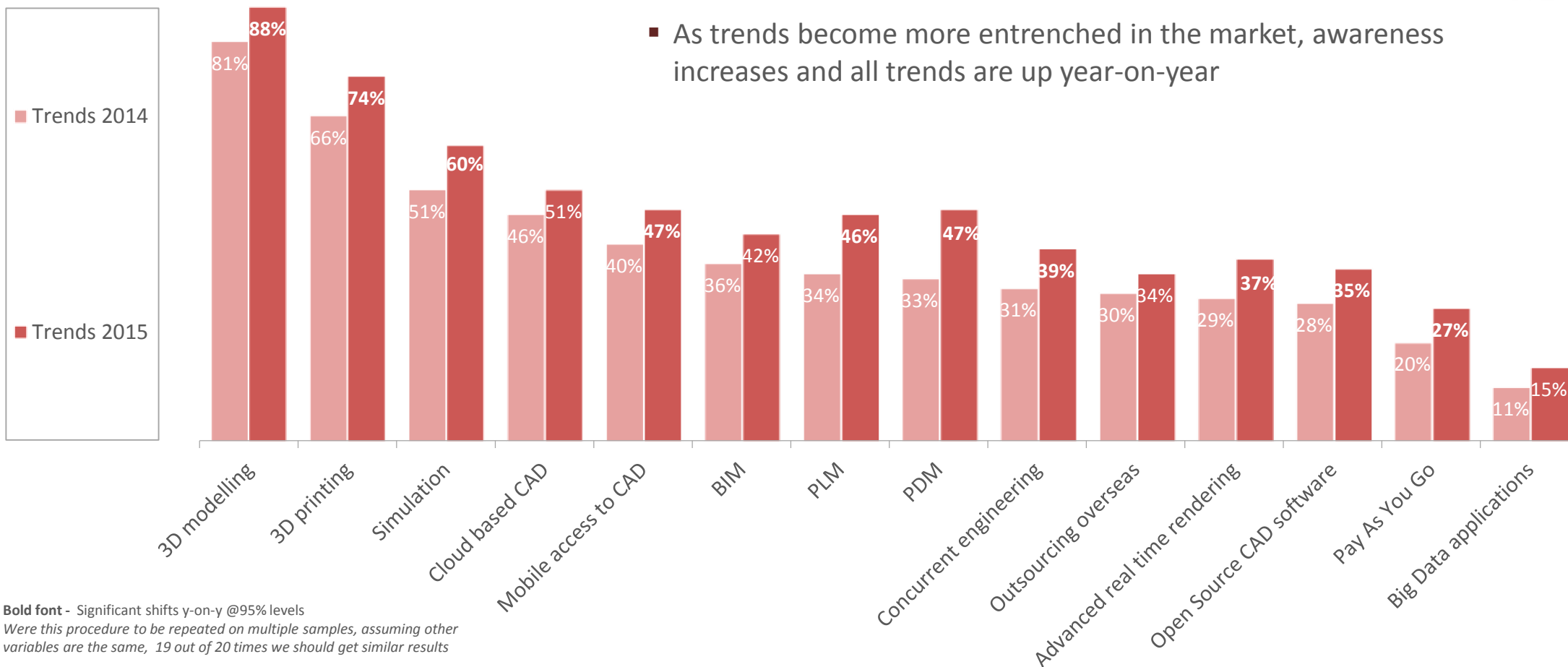
2015 AWARENESS AND CURRENT USAGE





Increase in Awareness Over Time

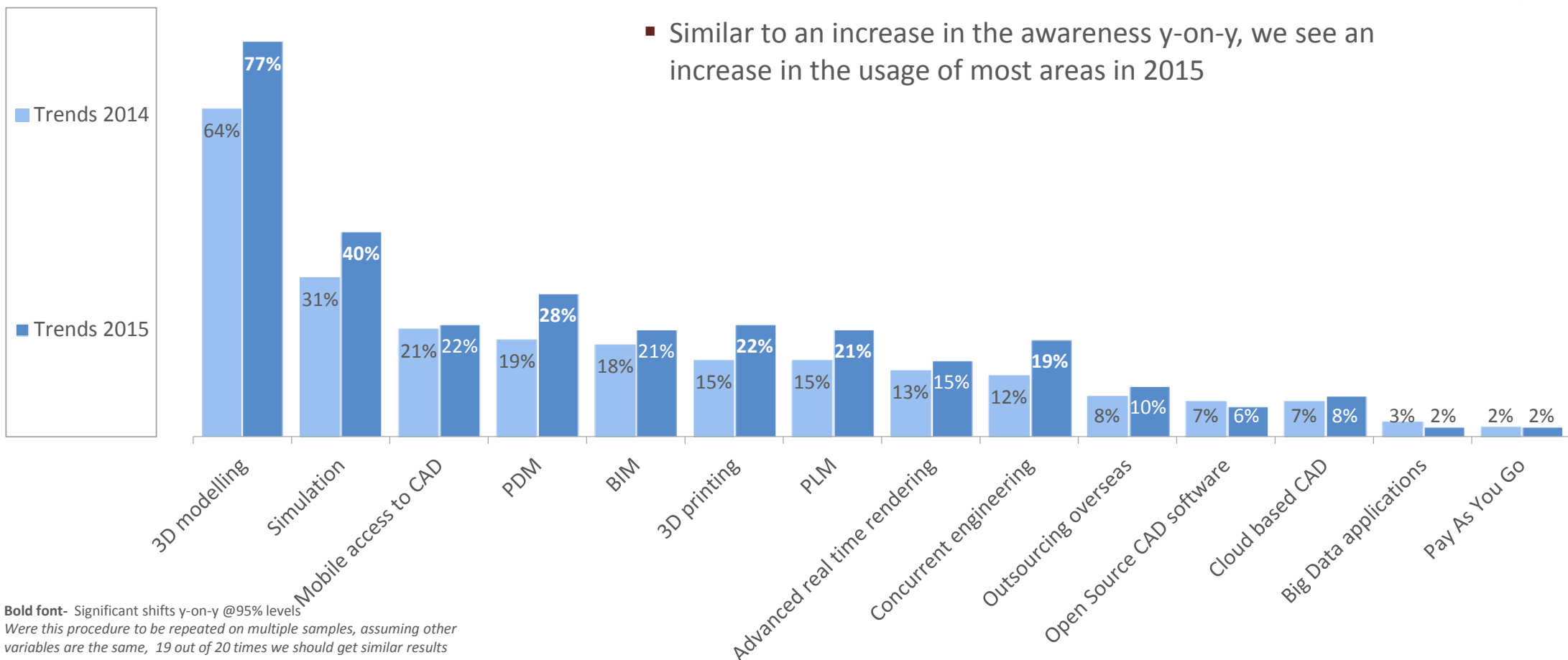
CURRENT TREND SNAPSHOT - AWARENESS





Increase in Usage Over Time

CURRENT TREND SNAPSHOT - USAGE



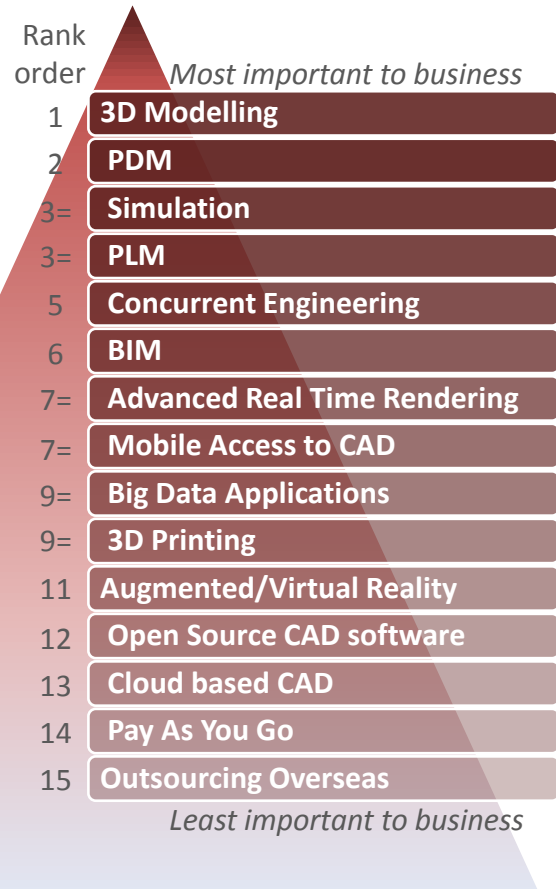
Bold font- Significant shifts y-on-y @95% levels
 Were this procedure to be repeated on multiple samples, assuming other variables are the same, 19 out of 20 times we should get similar results



Current Trends Snapshot Importance



CAD TRENDS IMPORTANCE RANKING 2015



- Some CAD trends are significantly more important to particular sectors, regions and company types...
 - PDM is significantly more important in large companies
 - Simulation in Manufacturing
 - PLM in APAC and large companies
 - Understandably, BIM in AEC
 - 3D Printing in Manufacturing and large companies
 - Open Source CAD software in EMEA, APAC and small companies
 - Outsourcing overseas in large companies

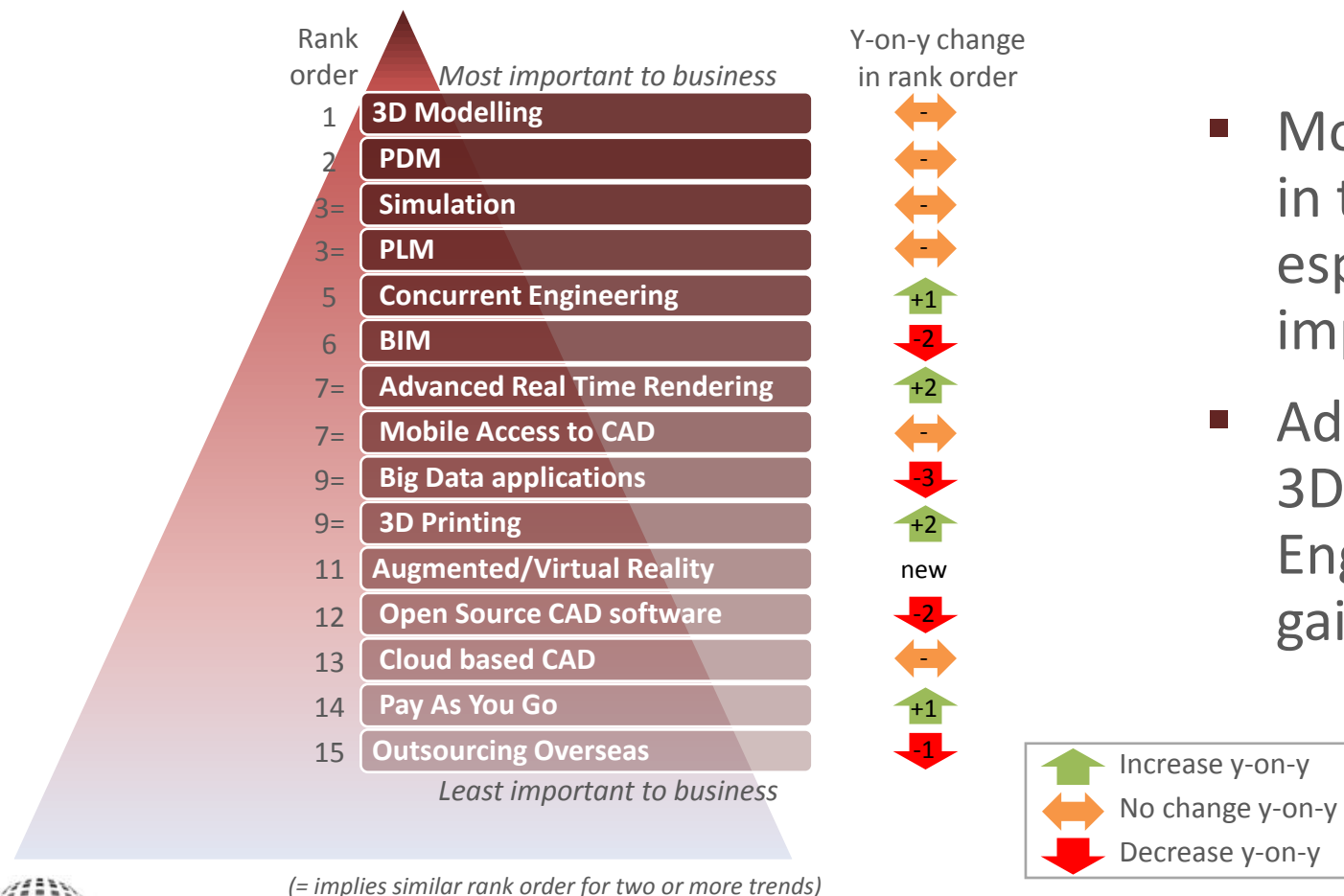
(= implies similar rank order for two or more trends)



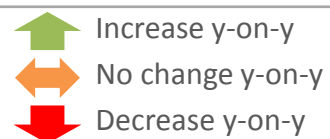


Importance Ranking Over Time

CAD TRENDS IMPORTANCE RANKING 2015 AND Y-ON-Y CHANGE



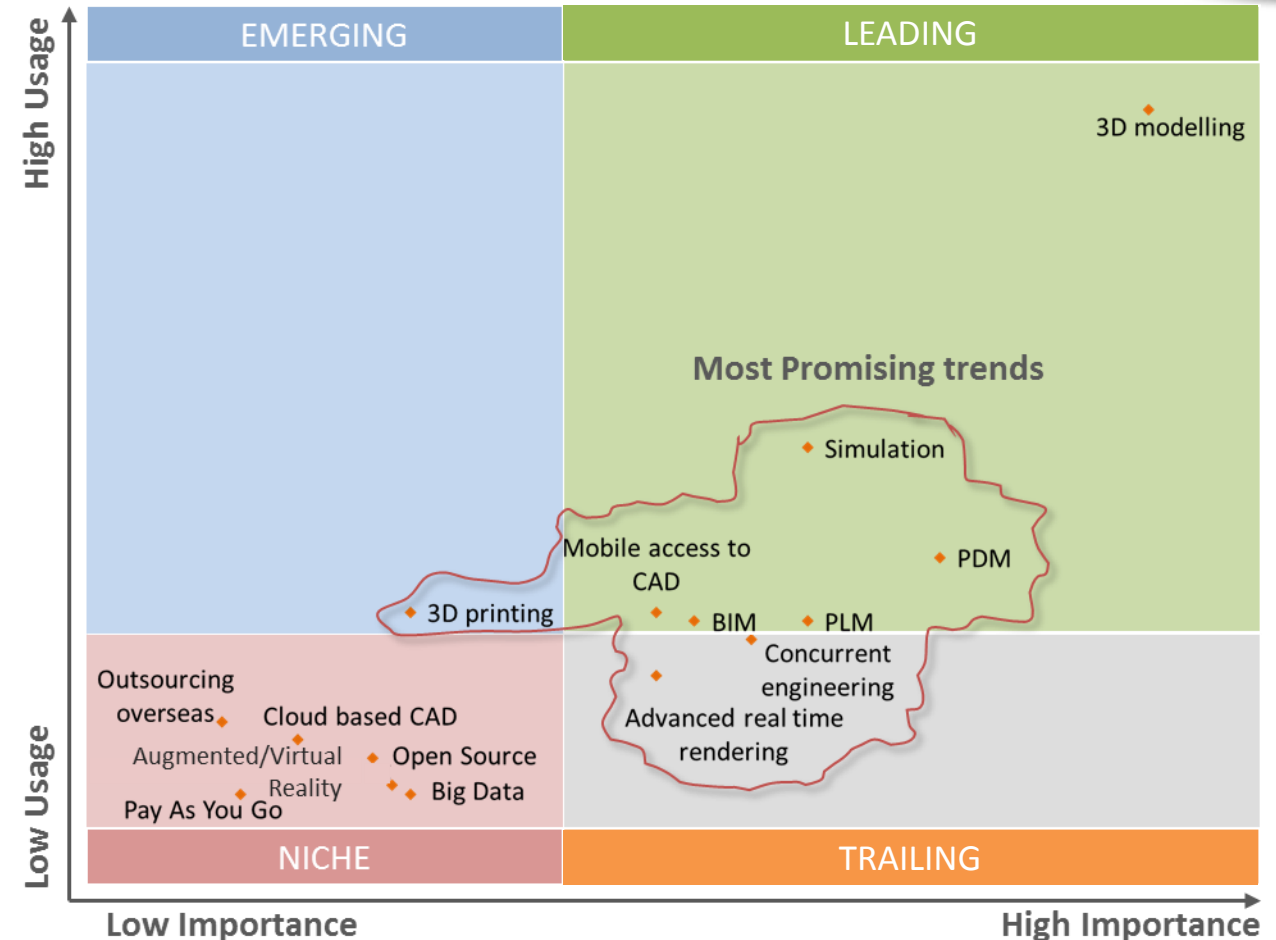
- Most CAD Trends are stable y-on-y in terms of their importance ratings especially those with high importance ratings however,
- Advanced Real Time Rendering and 3D Printing followed by Concurrent Engineering and Pay As You Go have gained on importance year-on-year



Snapshot of Usage and Importance

2015 USAGE AND IMPORTANCE

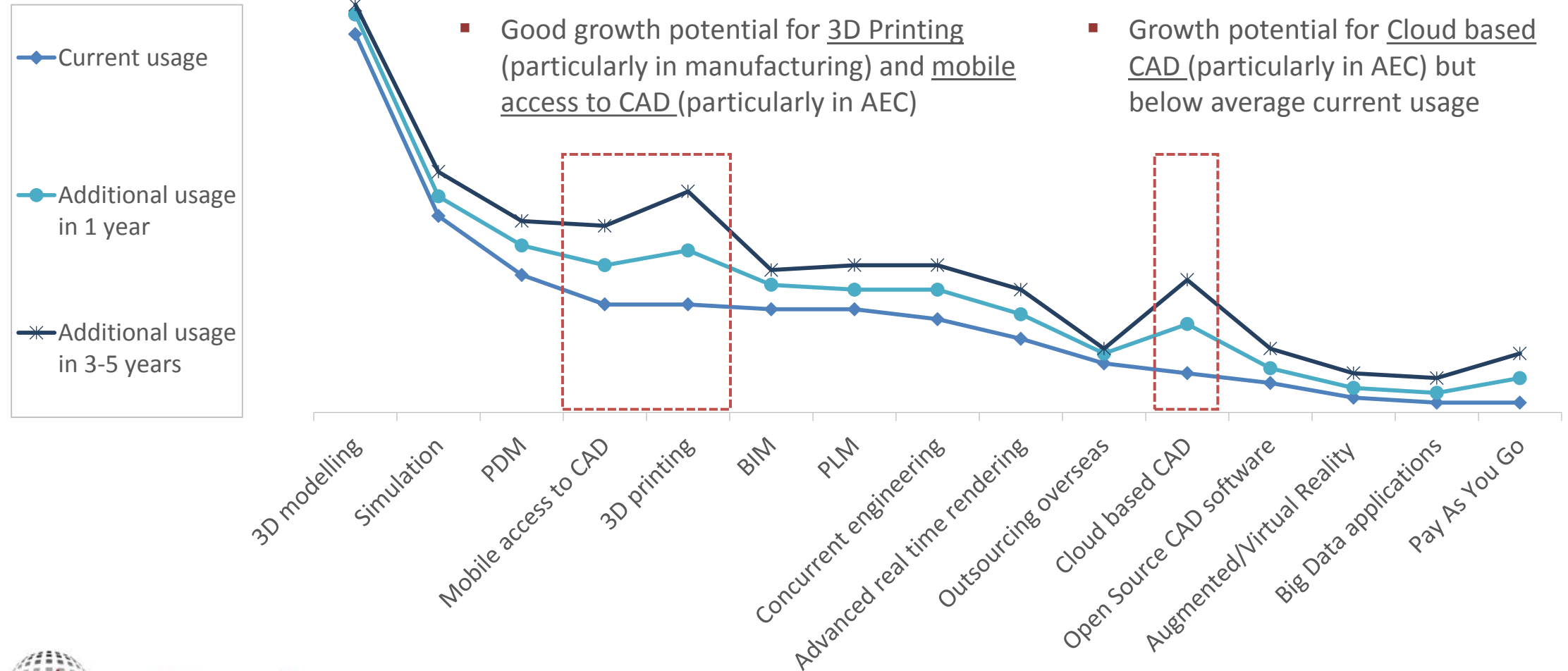
- Plotting perceived importance of trends against current usage
- The market is still strongly focused on 3D modelling however,
 - there are a number of trends following on which will become increasingly key for CAD software/solution providers



Looking to the Future



PREDICTED USAGE





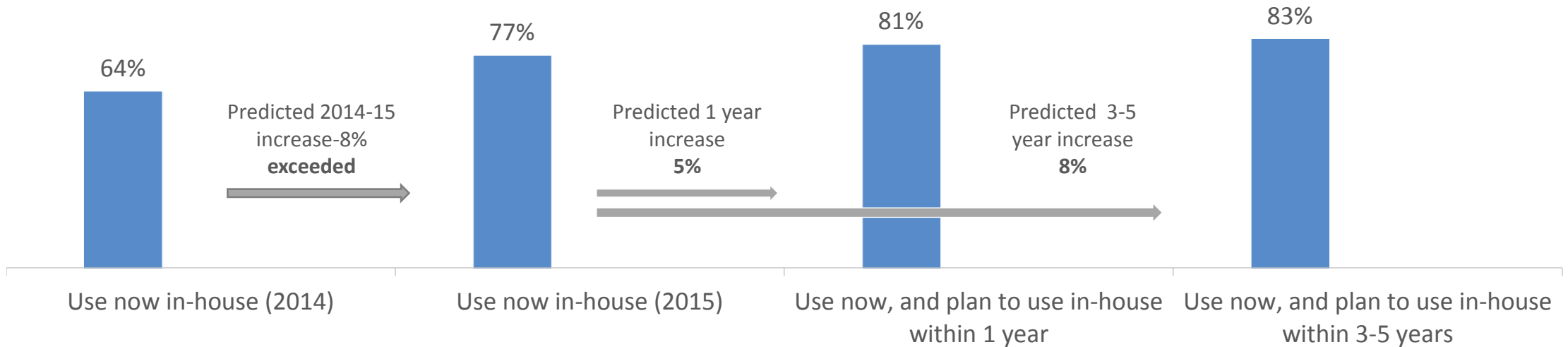
Diagnostics on Current and Future Usage of each of the CAD Trends 2015

CAD Trends by importance rank order with analysis on sectors with appreciable differences in current and future usage



3D Modelling

2015 IMPORTANCE MEAN SCORE 8.5



KEY FACTS

Observation: 3D Modelling is a core and slow growth area in today's market, with high importance and usage (both show an increase year-on-year).

Forecast: Future predicted growth potential is limited, due to majority already using 3D modelling.

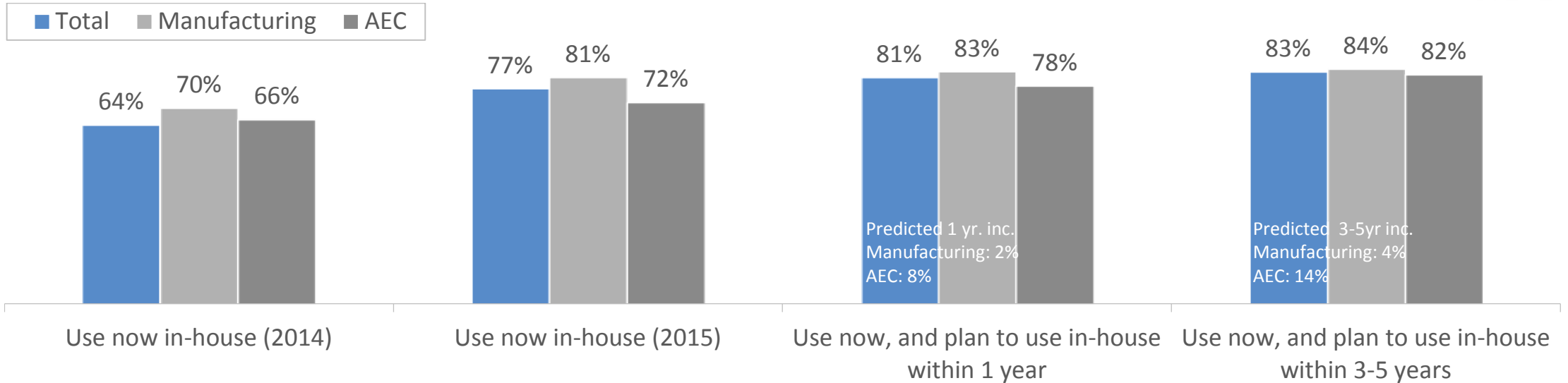
Sectors: Generally high current usage across industry sectors, and similarly high usage across regions and countries.

Co. Size: Small companies (1-50 employees) are less likely to be current users (although 7 in 10 still use).

3D Modelling by Key Sectors



2015 IMPORTANCE MEAN SCORE: OVERALL 8.5, MANUFACTURING 9.1, AEC 8.0

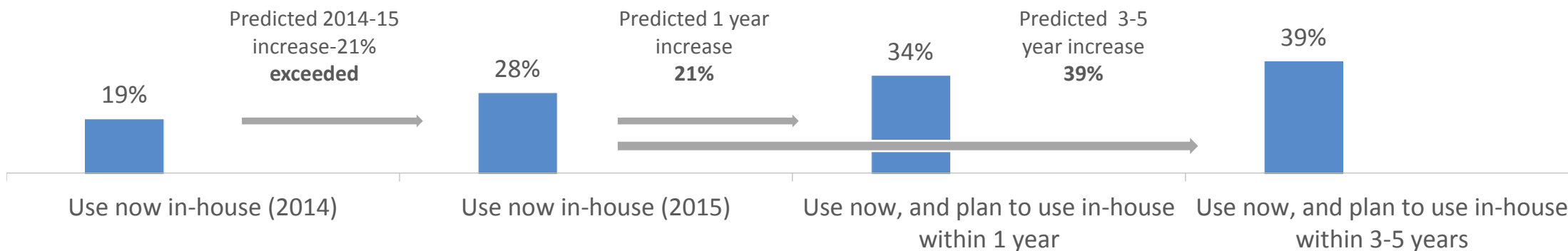


Sector: The AEC sector is predicted to close the gap on the Manufacturing sector for usage of 3D modelling.

Forecast: Whilst currently Manufacturing companies are more likely to use 3D modelling, growth of 3D modelling in the AEC sector is predicted to be up to 4 times higher than Manufacturing, over the next year and 3-5 years.

Product Data Management (PDM)

2015 IMPORTANCE MEAN SCORE 7.4

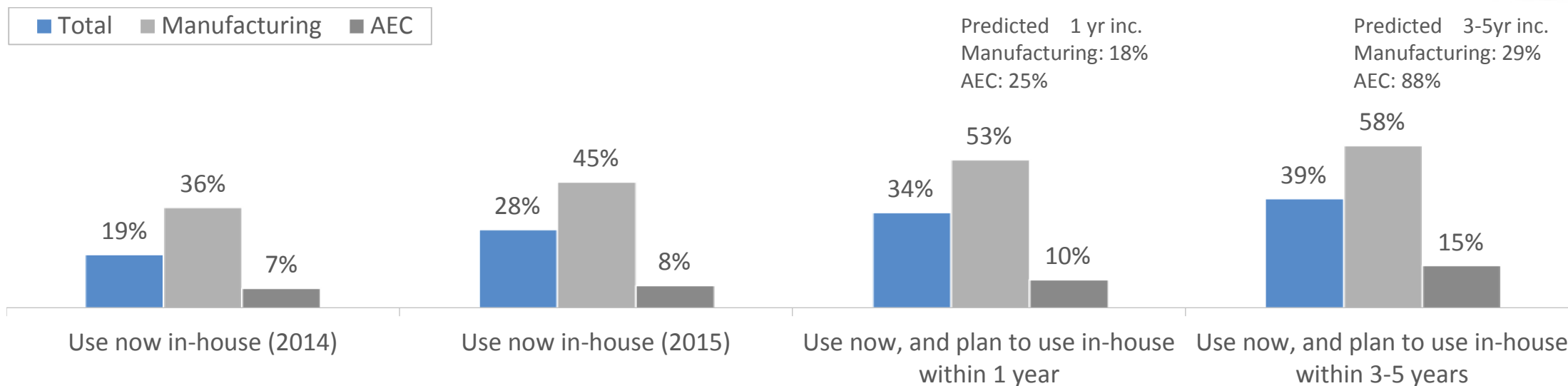


KEY FACTS

- Observation:** An increasingly important area in today's market, with growing importance and usage.
- Forecast:** More than doubled predicted increase in usage 2014 to 2015. Good future predicted growth potential.
- Sector:** Significantly lower current usage in AEC and Government than any other sector.
- Co. Size:** Higher current usage in large companies (40%) compared to medium (30%) or small (15%) companies .

Product Data Management (PDM) Key Sectors

2015 IMPORTANCE MEAN SCORE: OVERALL 7.4, MANUFACTURING 7.5, AEC 6.7



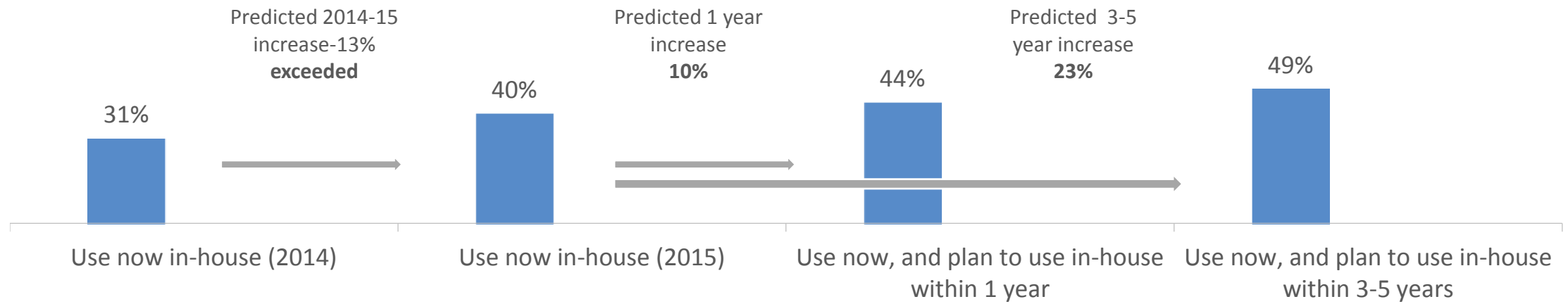
Observations: The Manufacturing sector will continue to dominate in usage of Product Data Management.

Forecast: Although AEC usage of PDM is predicted to almost double in the next 3-5 years compared to 2015, this is from a low base level, and will still fall significantly behind usage in the Manufacturing sector, which is predicted to grow by almost a third in the next 3-5 years.



Simulation

2015 IMPORTANCE MEAN SCORE 6.7



KEY FACTS

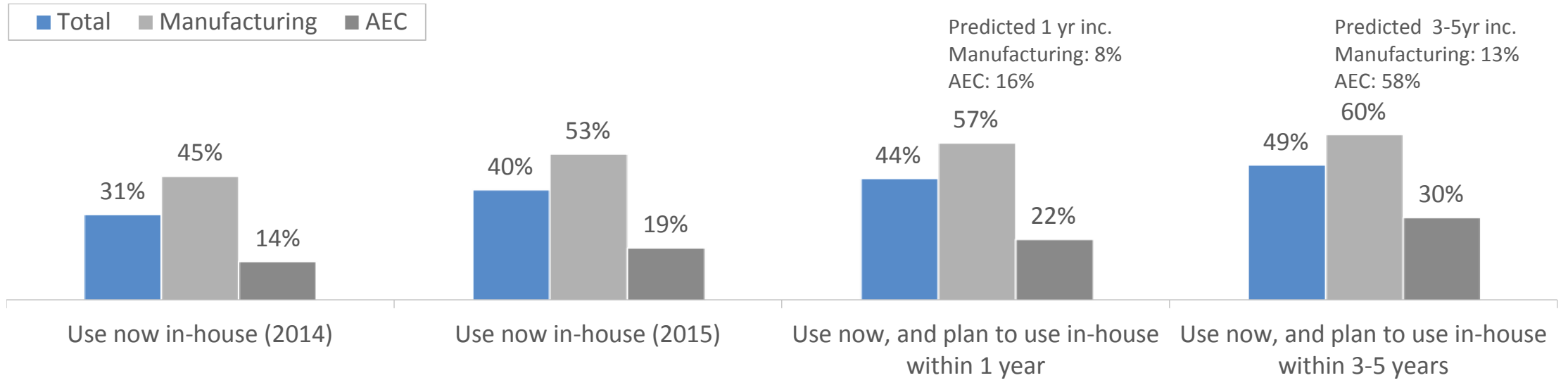
- Observation:** Simulation is a growth area in today's market, with high importance and higher than average usage.
- Forecast:** Both importance and usage increased y-on-y, usage is more than double the forecast in 2014, although relatively limited predicted growth compared to other trends.
- Co. Size:** More likely to be used currently in large companies (55%) than small (26%) or medium (40%) companies.
- Sectors:** Usage of Simulation is seen mostly for design optimisation (70%), design validation (63%) or mechanical simulation (62%) (*based on those using or planning to use simulation – 313*)
- Drivers:** Ease of use for less experienced designers would be a key driver in encouraging additional use of simulation software (52%) or a 50% cost reduction (33%). Expert support for usage guidance is generally expected as part of the package (47%).





Simulation by Key Sectors

2015 IMPORTANCE MEAN SCORE: OVERALL 6.7, MANUFACTURING 7.5, AEC 5.2



KEY FACTS

Observation: The Manufacturing sector will continue to dominate usage of Simulation.

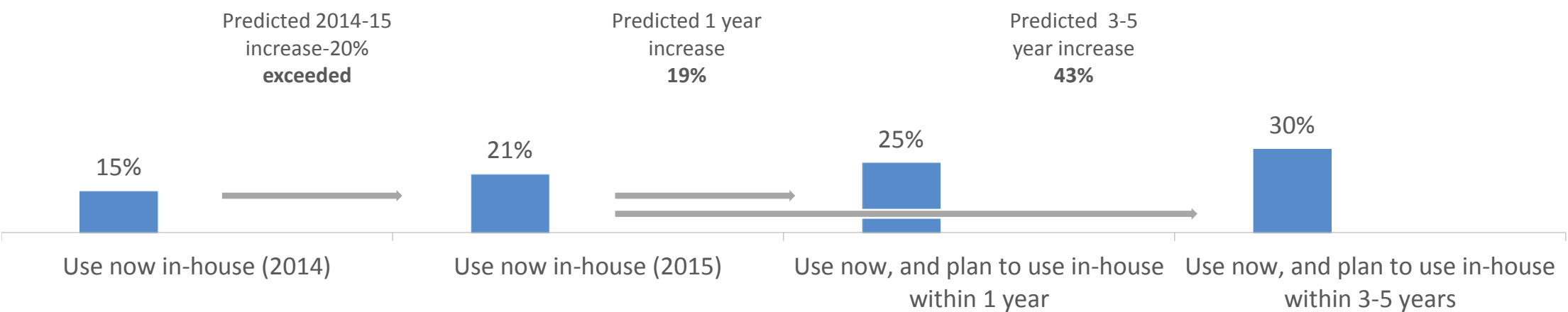
Forecast: Manufacturing sector is predicted to rise by 13% in the next 3-5 years (base year 2015). AEC usage is predicted to grow by almost 60% in the next 3-5 years (base 2015), but its absolute level of usage is still likely to be half of that seen in the Manufacturing sector.





Product Lifecycle Management (PLM)

2015 IMPORTANCE MEAN SCORE 6.7



KEY FACTS

Observation: PLM is a growing area in today's market.

Forecast: Increasing importance and usage (more than double in 3-5 years compared to 2014 prediction), although relatively limited predicted growth compared to others.

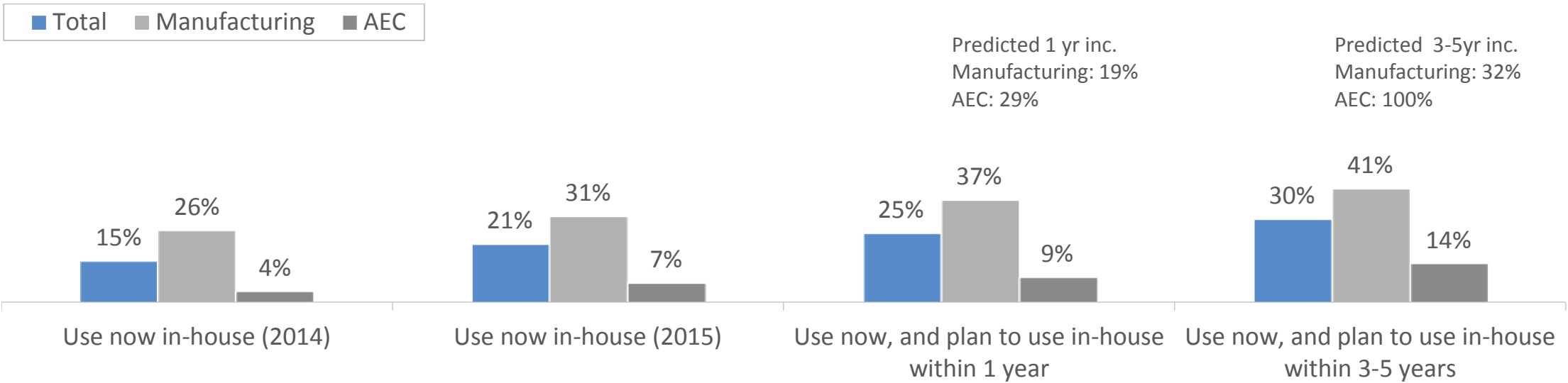
Co. Size: Higher current usage in large companies (38%) than small (8%) or medium companies (19%).

Benefits: Siemens Teamcenter (29%) and PTC Windchill (26%) are the main products used and the perceived benefits are savings on design time (57%), design improvements (52%), faster time to market (40%) and cost savings (37%).



PLM by Key Sectors

2015 IMPORTANCE MEAN SCORE: OVERALL 6.7, MANUFACTURING 7.1, AEC 5.9



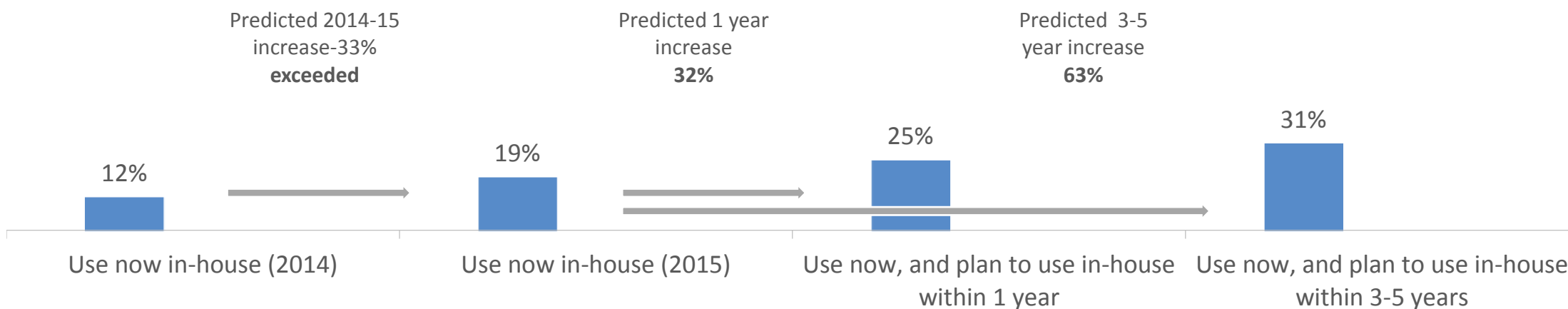
KEY FACTS

Observations: The Manufacturing sector dominates usage of PLM.

Forecast: Use of PLM in Manufacturing is predicted to grow by 32% in the next 3-5 years (base year 2015). AEC usage of PLM is likely to double in the next 3-5 years however, this is from a low base.

Concurrent Engineering

2015 IMPORTANCE MEAN SCORE 6.4



KEY FACTS

Observation: Concurrent Engineering is an area of increasing interest in today's market

Forecast: Importance and usage are both likely to increase with an average predicted future growth (across both 12 month and 3-5 years).

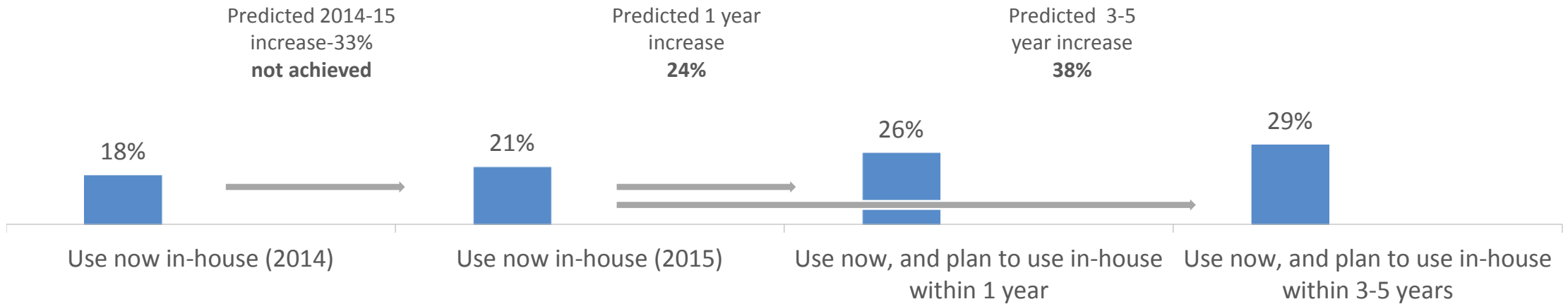
Sectors: Higher usage in medium sized companies (23%) followed by small companies (13%).

Co. Size: Higher predicted usage in the short term (next 12 months) for larger companies.

Regions: The current usage is higher in North America (24%), followed by EMEA (16%) and APAC (12%)

Building Information Modelling (BIM)

2015 IMPORTANCE MEAN SCORE 6.1



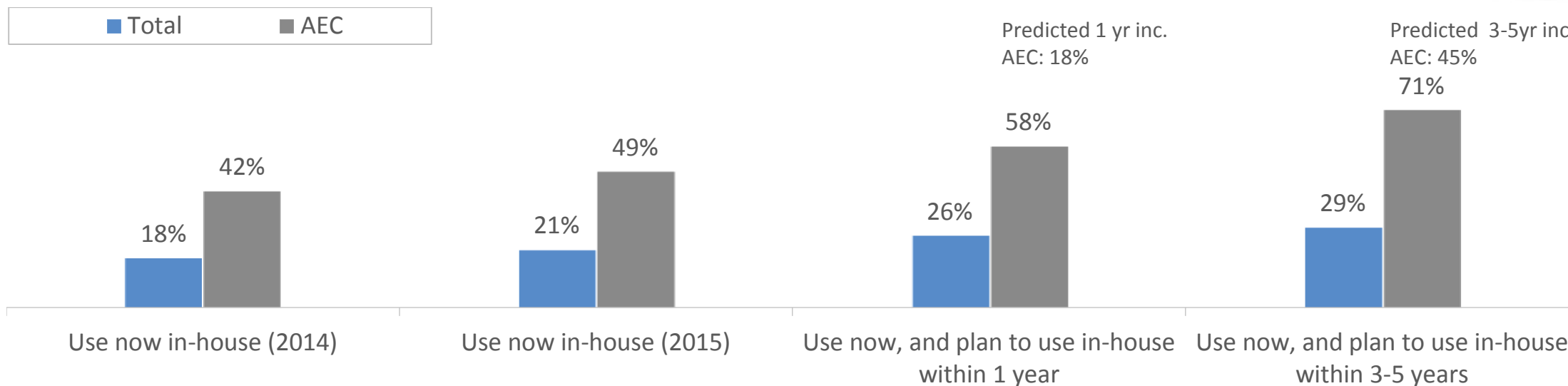
Observation: BIM is an area in flux in today's market, with unrealised predicted growth.

Forecast: Only half of predicted year-on-year growth is achieved in 2015. Decline in importance and below average predicted future growth.

Benefits: Benefits of using BIM are seen as design improvement (69%), savings on design time (54%) and cost savings (34%), as well as faster response times to market (24%) *(based on those using or planning to use BIM – 175).*

BIM by Key Sectors

2015 IMPORTANCE MEAN SCORES: OVERALL 6.1, AEC 7.1



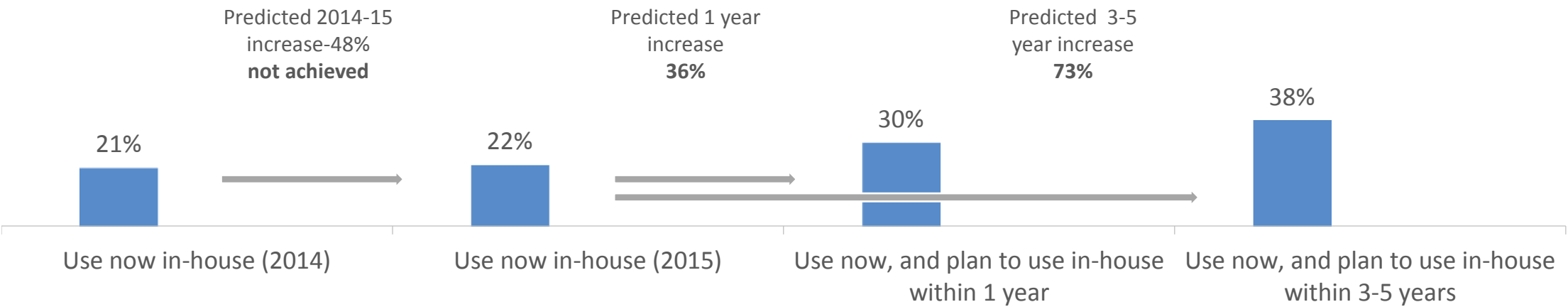
Observation: As expected BIM current usage and future usage will continue to be dominated by the AEC sector.

Forecast: The usage in the AEC sector is predicted to grow by 45% in the next 3-5 years.



Mobile Access to CAD

2015 IMPORTANCE SCORE 5.9



KEY FACTS

Observation: Mobile Access to CAD is a stable area in today's market, with slightly above average importance and usage.

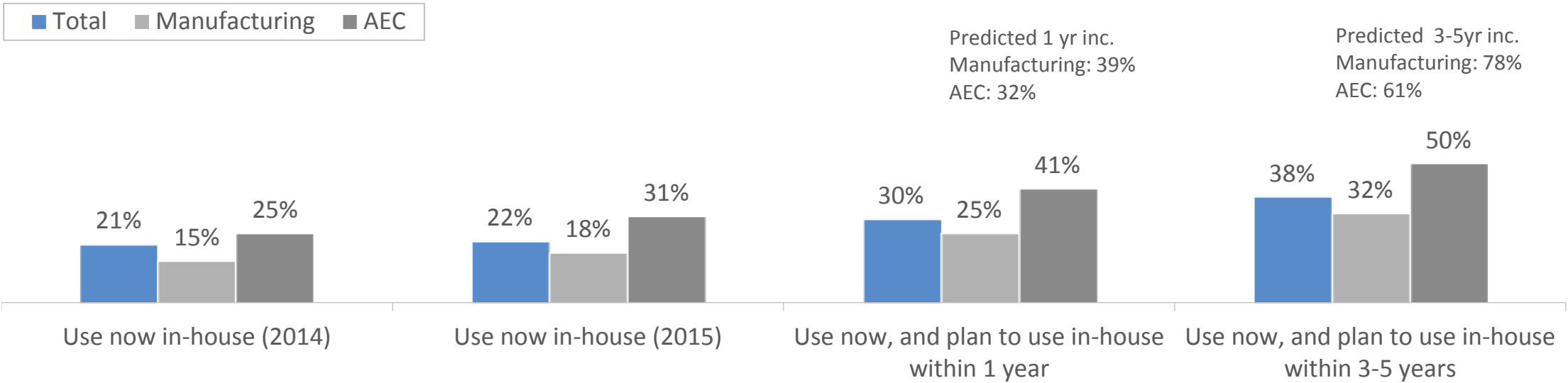
Forecast: Average predicted future growth (although predicted growth in 2014 was not met).

Regions: Current usage is significantly higher in North America (26%) than APAC (17%). Although longer term predicted growth (3-5 years) is more likely to come from APAC. This trend is reflected in the current and predicted hardware usage.



Mobile Access to CAD by Key Sectors

2015 IMPORTANCE MEAN SCORE: OVERALL 5.9, MANUFACTURING 5.6, AEC 6.2



KEY FACTS

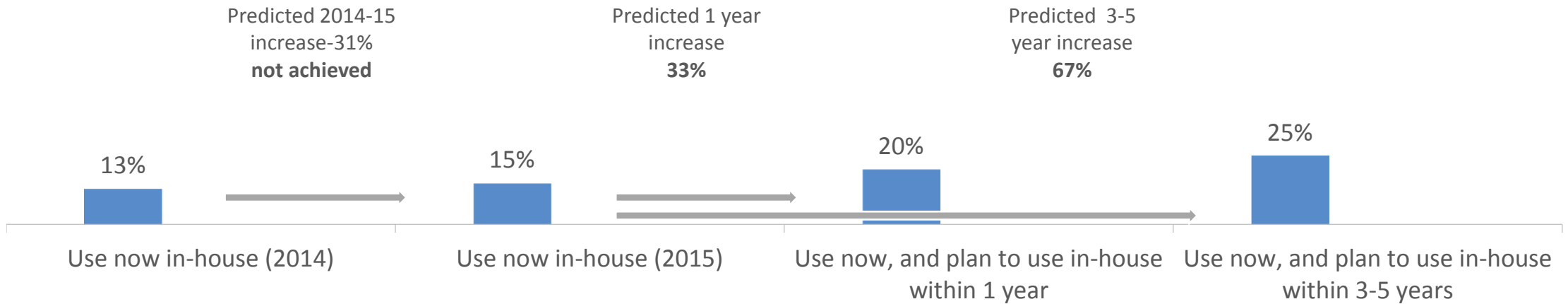
Observation: Current usage of Mobile Access to CAD is driven by the AEC sector.

Forecast: The usage of Mobile Access to CAD is predicted to grow significantly in both sectors however, overall usage will continue to remain higher for AEC.



Advanced Real-Time Rendering and Visualisation

2015 IMPORTANCE MEAN SCORE 5.9



KEY FACTS

Observation: Stable trend in today's market, with around average importance (up y-on-y) and usage

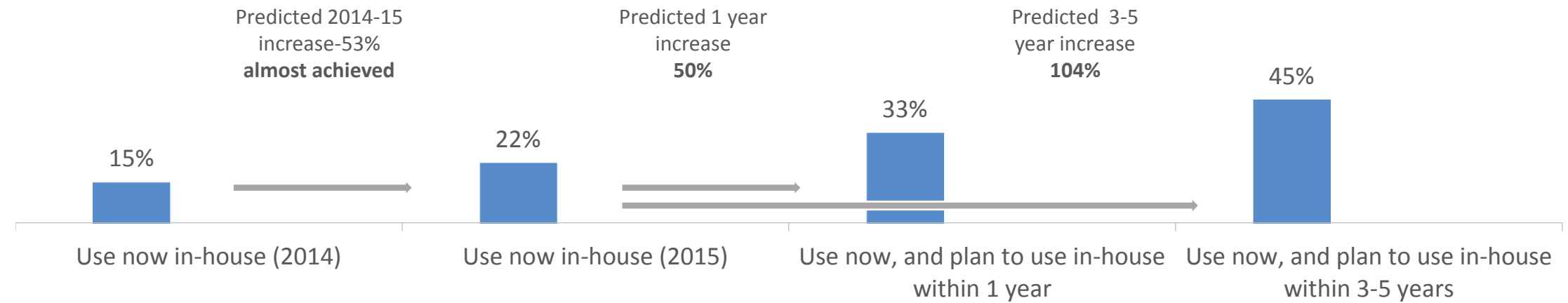
Forecast: Average predicted future growth.

Sectors: Stable across industry sectors and regions.



3D Printing

2015 IMPORTANCE MEAN SCORE 4.6



KEY FACTS

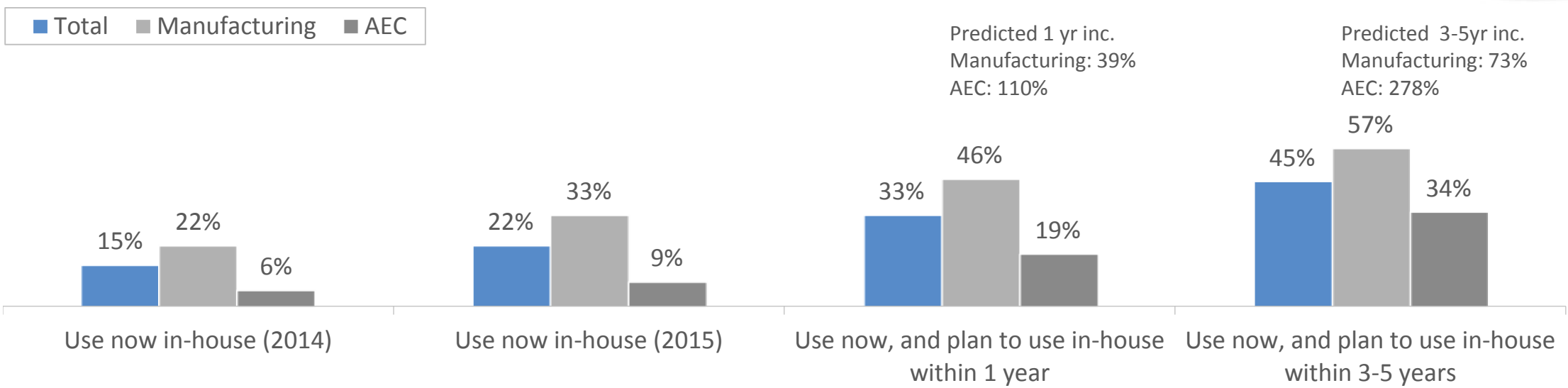
- Observation:** Currently a niche area of interest in today's market, with increasing usage, although below average importance.
- Forecast:** Strong predicted future growth potential.
- Regions:** Higher current usage in Americas (28%) than EMEA (17%)
- Co. Size:** Higher current usage in medium (24%) and large companies (34%) than small companies (9%).
- Other:** Limited brand recognition with half unable to name their brand (51%). 1 in 5 (20%) use Stratasys, and 1 in 10 use Makerbot, 3D Systems and Cubify.
- Benefits:** Benefits of 3D printing seen as design improvements (66%), savings on design time (48%) and cost savings (24%), as well as faster response time to market (36%) *(based on those using or planning to use 3D printing – 289)*





3D Printing by Key Sectors

2015 IMPORTANCE MEAN SCORES: OVERALL 4.6, MANUFACTURING 5.6, AEC 3.5



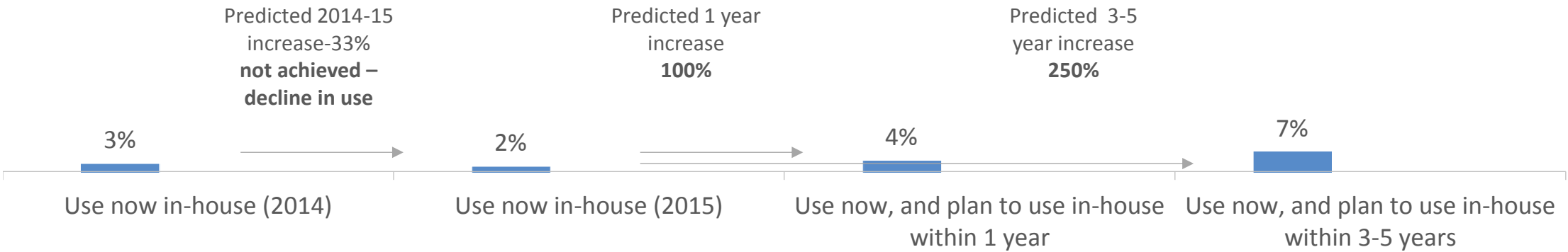
KEY FACTS

Observation: The Manufacturing sector will continue to dominate usage of 3D printing, but over 3 to 5 years the AEC sector will move towards closing the gap.

Forecast: Usage of 3D printing in the Manufacturing sector is predicted to grow by 73% in the next 3-5 years, usage in AEC is predicted to grow 278%. Strong perceived growth in AEC is likely to impact the overall forecast of usage. Overall usage is likely to increase by more than double in the next 3-5 years

Big Data Applications

2015 IMPORTANCE MEAN SCORE 4.6

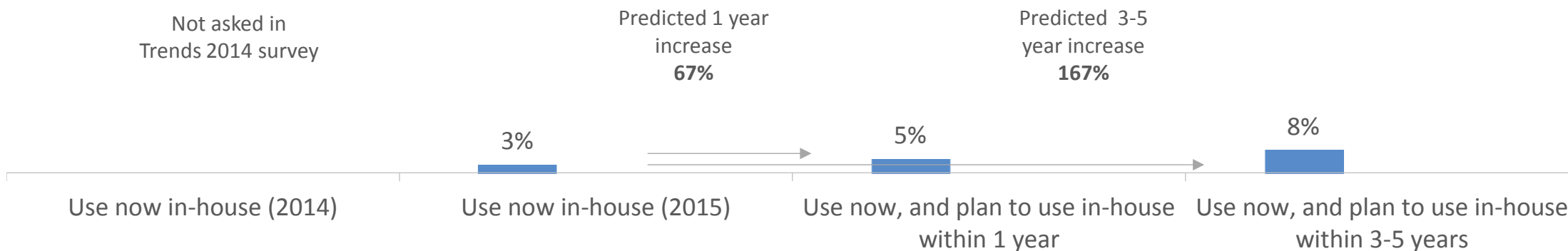


KEY FACTS

- Observation:** Niche area in today’s market, with very low current usage (down y-on-y).
- Forecast:** The future growth prediction is very high but, from a very low current base. Only 1 in 50 currently using Big Data (true across all industry sectors/regions).
- Benefits:** Benefits of Big Data are seen as design improvements (56%), savings on design time (44%) and cost savings (34%), as well as faster response times to market (25%), and a range of solutions currently in use, mainly provided by SAP (30%) and Microsoft (26%) *(based on those using or planning to use Big Data n=43)*.
- Definition:** The definitions of Big Data vary hugely and range from data analysis (25%), helping to make well informed decisions (22%) or quick (19%) decisions, data mining (20%) and access to real time data (19%) but, over half are unable to give a clear definition *(based on those aware of Big Data n=94)*

Augmented/Virtual Reality

2015 IMPORTANCE MEAN SCORE 4.5



KEY FACTS

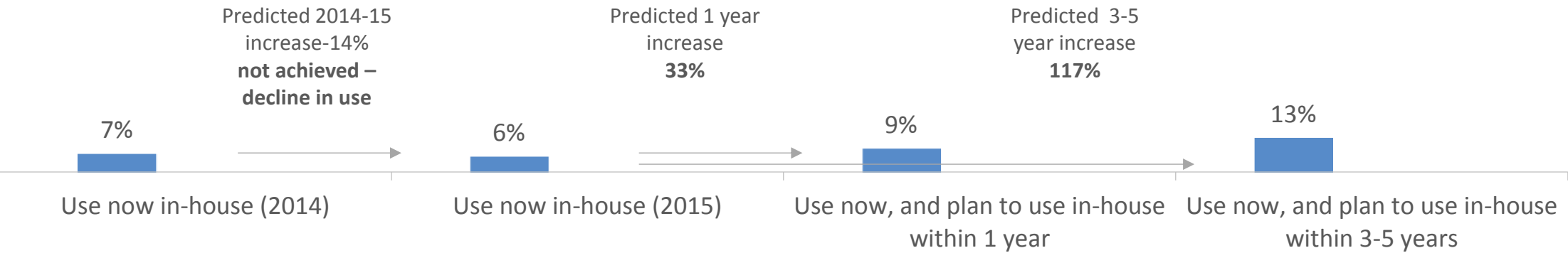
Observation: Very niche area in today's market with limited appeal, low importance and low current usage

Forecast: The future growth predictions are very high but, from a low base level. Only 1 in 33 currently use Augmented Reality.

Sectors: Low usage is evident across all industry sectors and regions. No particular area stands out for predicted future growth.

Open Source CAD Software

2015 IMPORTANCE MEAN SCORE 4.4

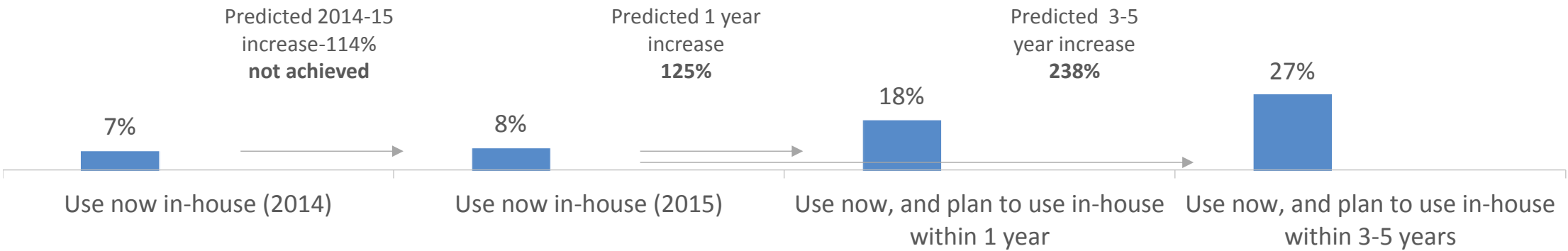


KEY FACTS

- Observation:** Very niche area in today’s market, with decline in the current usage, and below average importance.
- Forecast:** The future growth potential appears to be strong, particularly in the next 3-5 years but, this is from a low base level.
- Sectors:** Low usage is evident across all industry sectors and regions. There is some indication that the education sector is more likely to consider open source in the longer term.

Cloud Based CAD Applications

2015 IMPORTANCE MEAN SCORE 4.0



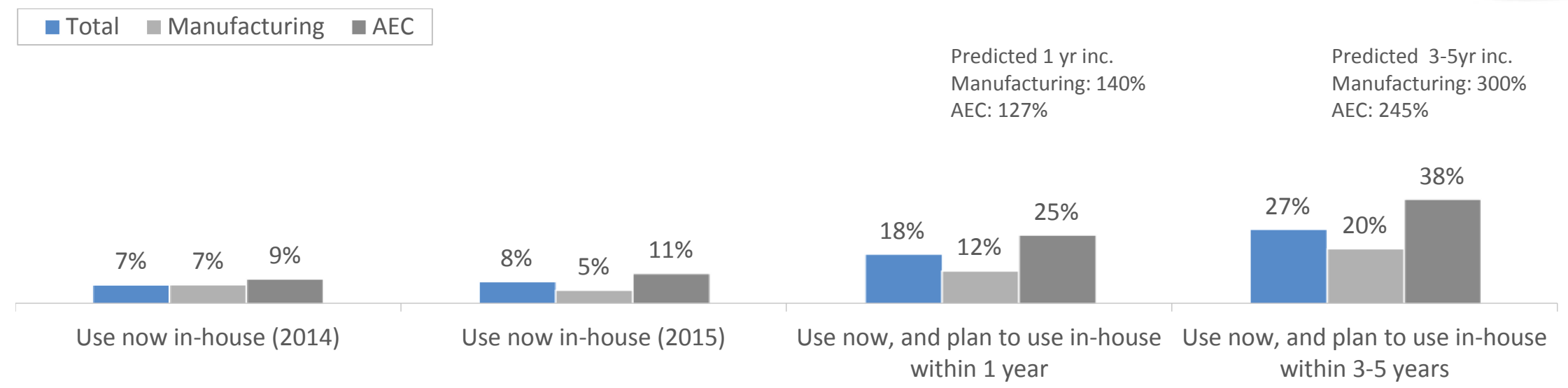
KEY FACTS

- Observation:** Cloud continues to be an area of interest in today’s market. The usage and importance are currently low and have remained relatively stable year-on-year.
- Forecast:** Good future predicted growth potential, particularly in the longer term of 3-5 years.
- Regions:** No major differences by region.
- Benefits:** The perceived benefits of cloud based CAD are higher mobility (66%), ease of updating software (45%), cost reductions (39%) and increased storage capacity (31%) *(based on those using or planning to use Cloud based CAD – 168).*



Cloud Based CAD by Key Sectors

2015 IMPORTANCE SCORE: OVERALL 4.0, MANUFACTURING 3.7, AEC 4.3



KEY FACTS

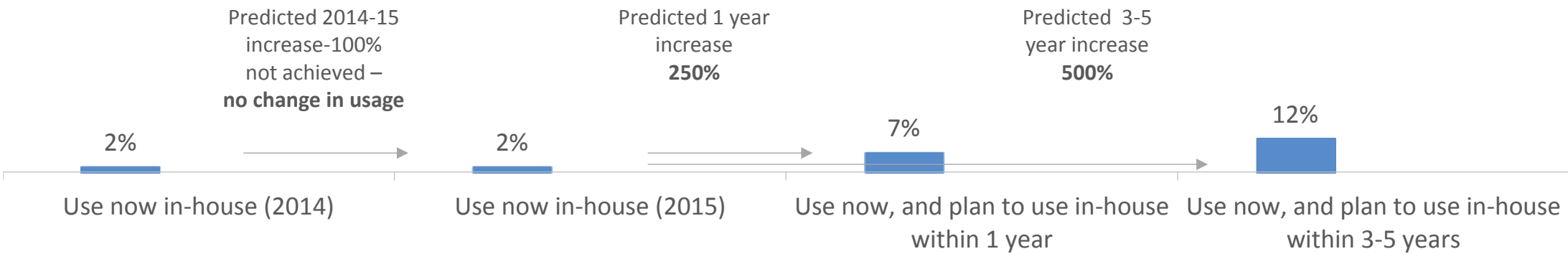
Observation: The AEC sector saw a year on year increase of 22%, whilst manufacturing did not show any positive uplift on last year.

Forecast: Both Manufacturing and AEC are predicted to show strong increase in usage over the next 3-5 years.



Pay As You Go CAD Software

2015 IMPORTANCE SCORE 3.7



KEY FACTS

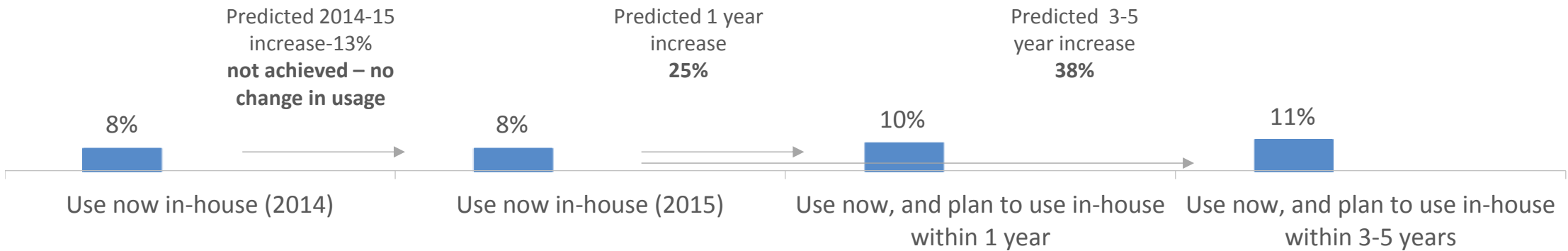
Observation: Very niche area in today’s market with limited appeal, low importance and very low usage

Forecast: Predicted future growth is very strong but, from a low baseline. We did not observe an increase in usage y-on-y, despite a prediction of 100% growth

Sectors: No differences noted across industry sectors and regions. In the coming year, a higher growth is predicted in North America and APAC compared to EMEA. In the longer term more growth is predicted from AEC compared to Manufacturing.

Outsourcing CAD Related Jobs Overseas

2015 IMPORTANCE MEAN SCORE 3.6

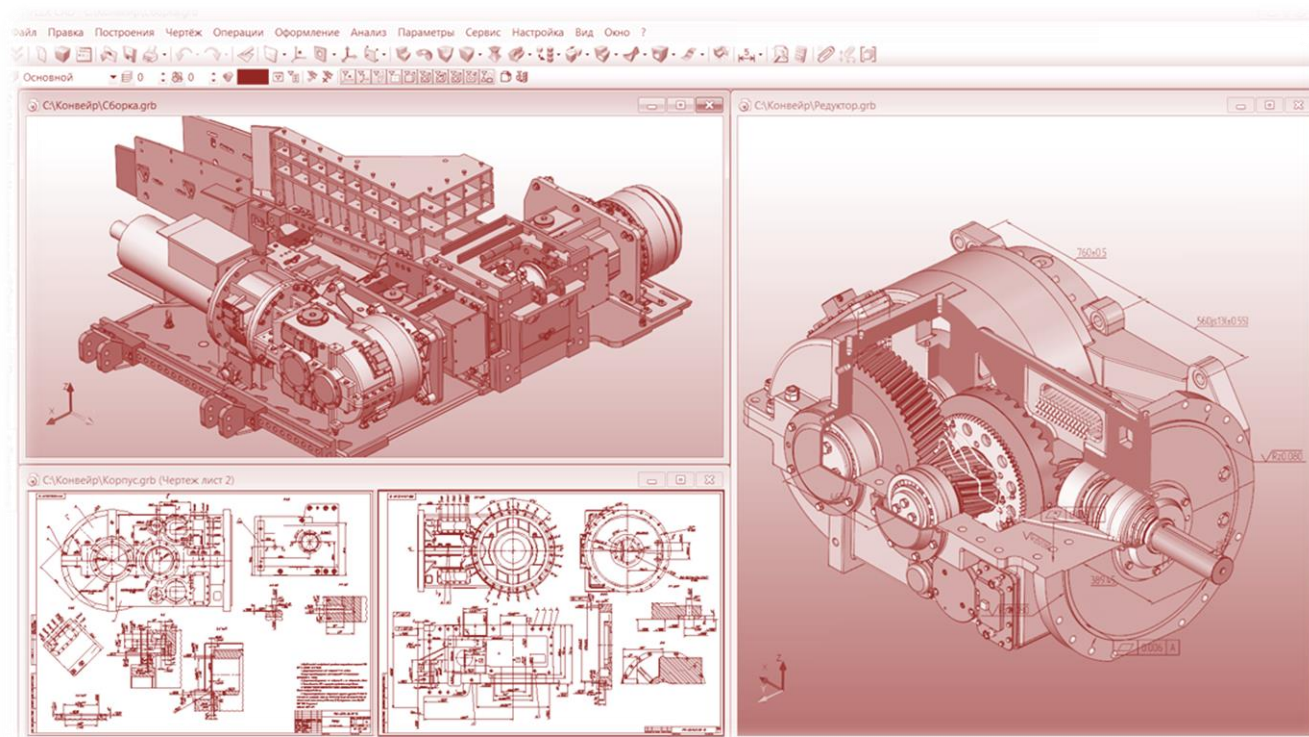


KEY FACTS

- Observation:** Outsourcing is a niche area in today’s market with below average importance and usage.
- Forecast:** Some limited signs of future growth, particularly in the longer term (3-5 years).
- Co. Size:** Unsurprisingly, higher current usage in large companies (15%) compared to small companies(4%). We also see higher current usage in North America (14%) compared to the EMEA (6%). Future predicted growth shows no significant differences by industry sector or region.

CAD Usage

Section Two





Most used CAD Software Packages

10 most used packages	Trends 2015	2015: <i>used significantly more by....</i>
1	AutoCAD	<i>AEC</i>
2	SolidWorks	<i>Manufacturing</i>
3	PTC Creo	<i>Manufacturing</i>
4	Inventor	<i>Manufacturing</i>
5	MicroStation	<i>AEC</i>
6	CATIA	
7	Pro/E	
8	NX	
9	Revit Architecture	
10	AutoCAD LT	





Most used Collaboration Software Tools

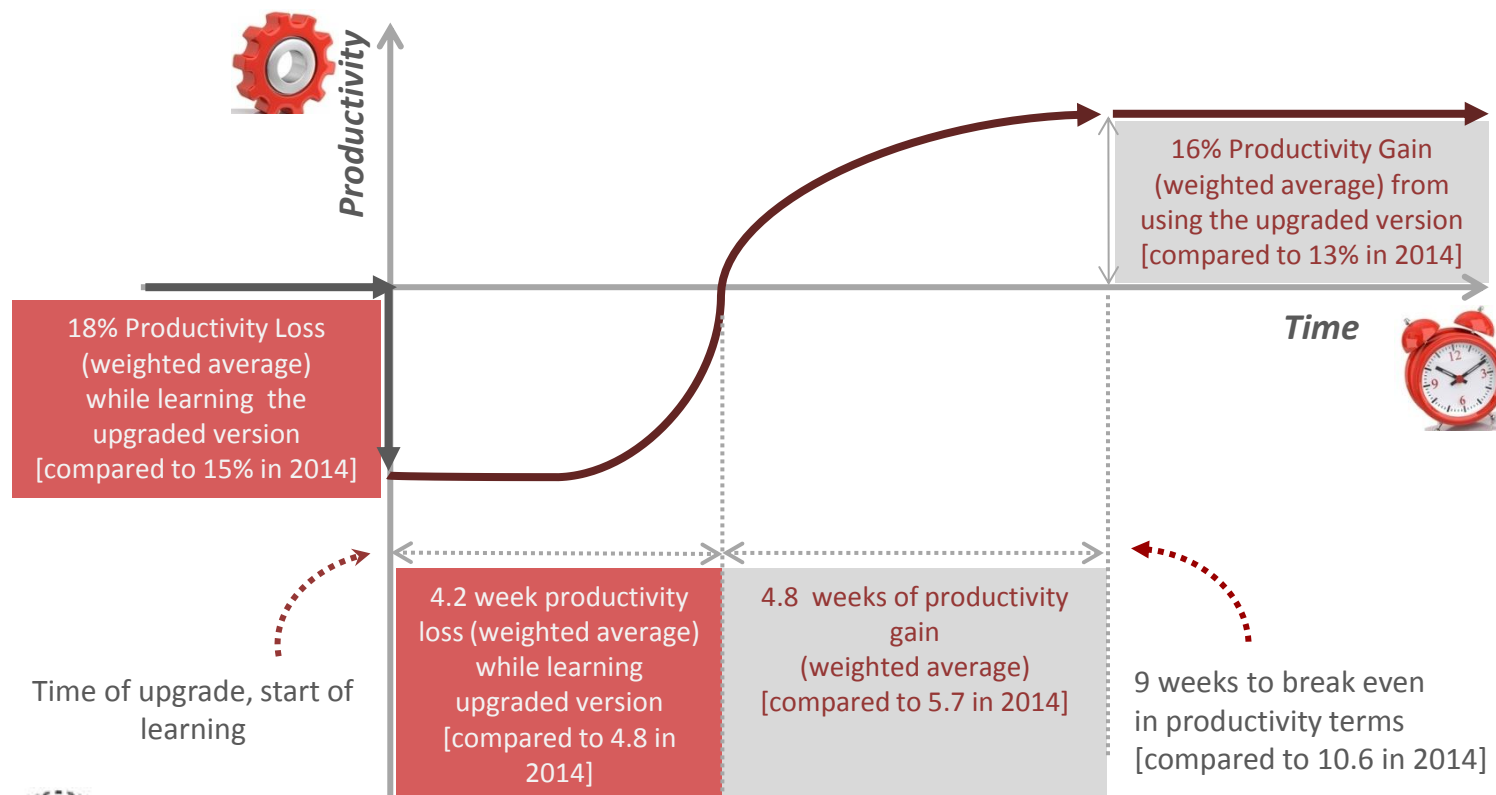
10 most used packages	Trends 2015	Used significantly more by....
1	1=PTC Windchill	
2	1=Autodesk Design Review	AEC
3	1=Siemens Teamcenter	
4	Autodesk Navisworks	AEC
5	5=Autodesk Vault	
6	5=Bentley ProjectWise	AEC
7	7=SolidWorks Enterprise PDM	
8	7=Autodesk Buzzsaw	
9	9=Bentley ProjectWise WebServer/Explorer	
10	9=Solidworks Workgroup PDM	

A third state they do not use collaboration software



Value in Software Upgrades

Just over half of those surveyed had upgraded, changed or added to their CAD software in the last 12 months, so were asked a series of questions around productivity during transition

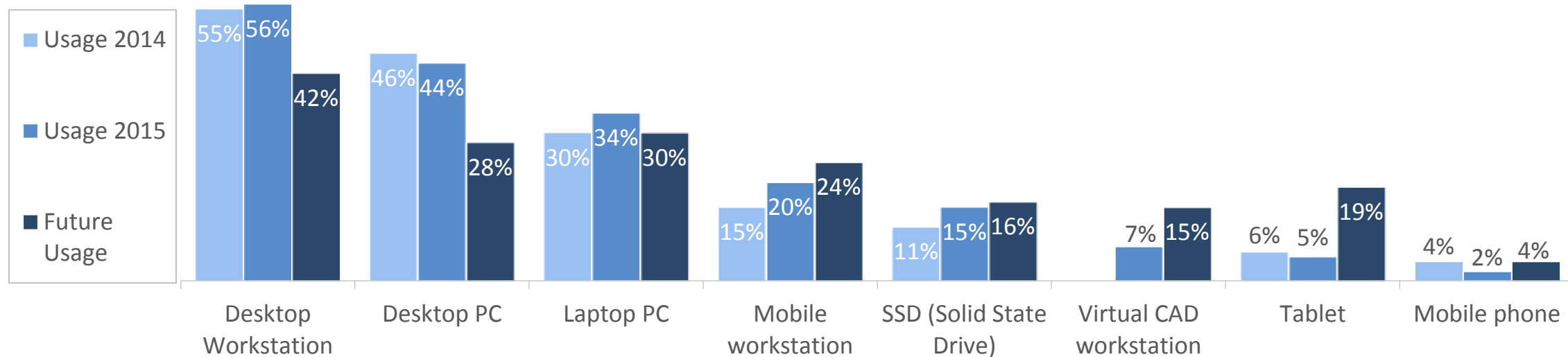


- The results show that on average CAD upgrades break even (in productivity terms) in just over 2 months (an improvement since 2014) and thereafter continue to produce productivity gains



Current and Future Usage of Hardware

WHAT HARDWARE IS BEING USED, AND WHAT WILL BE USED NEXT?



Observation: Current usage for desktop based solutions is stable, predicted decline in future demand. Interest in mobile phone usage remains relatively low

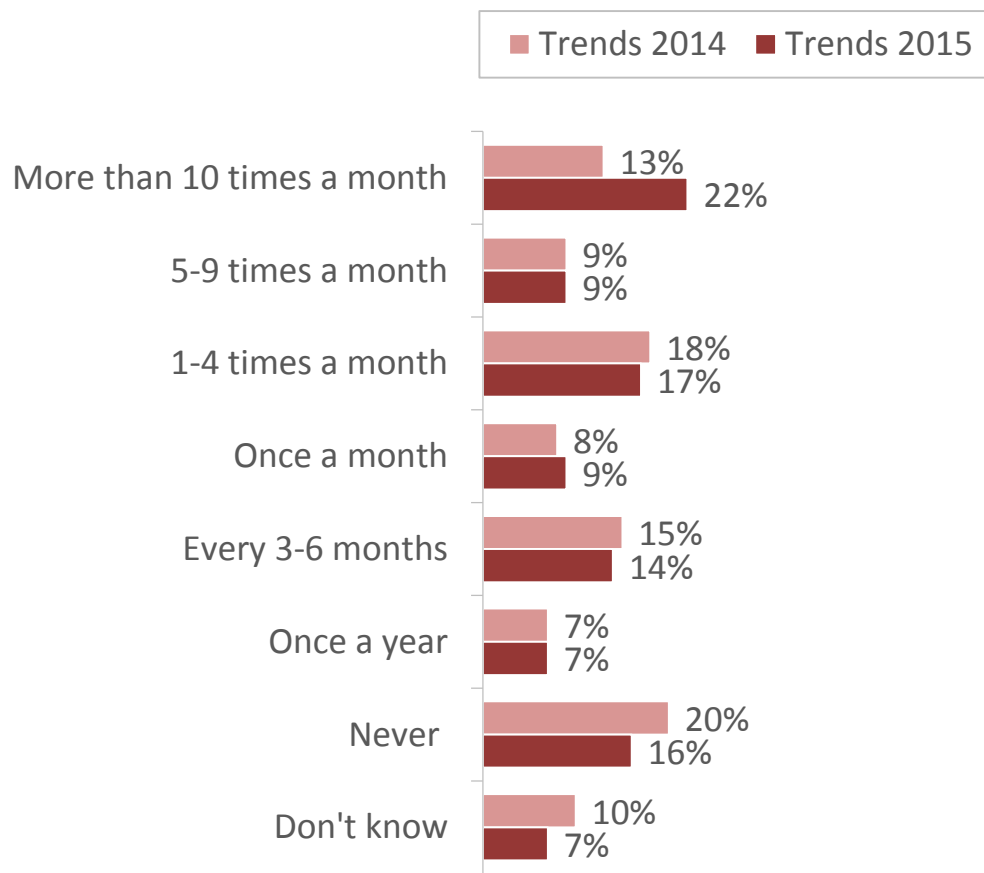
Forecast: Increase in the usage and demand for mobile /virtual solutions





Frequency of Downloading 3D Models

TREND 2015 AND Y-ON-Y COMPARISON



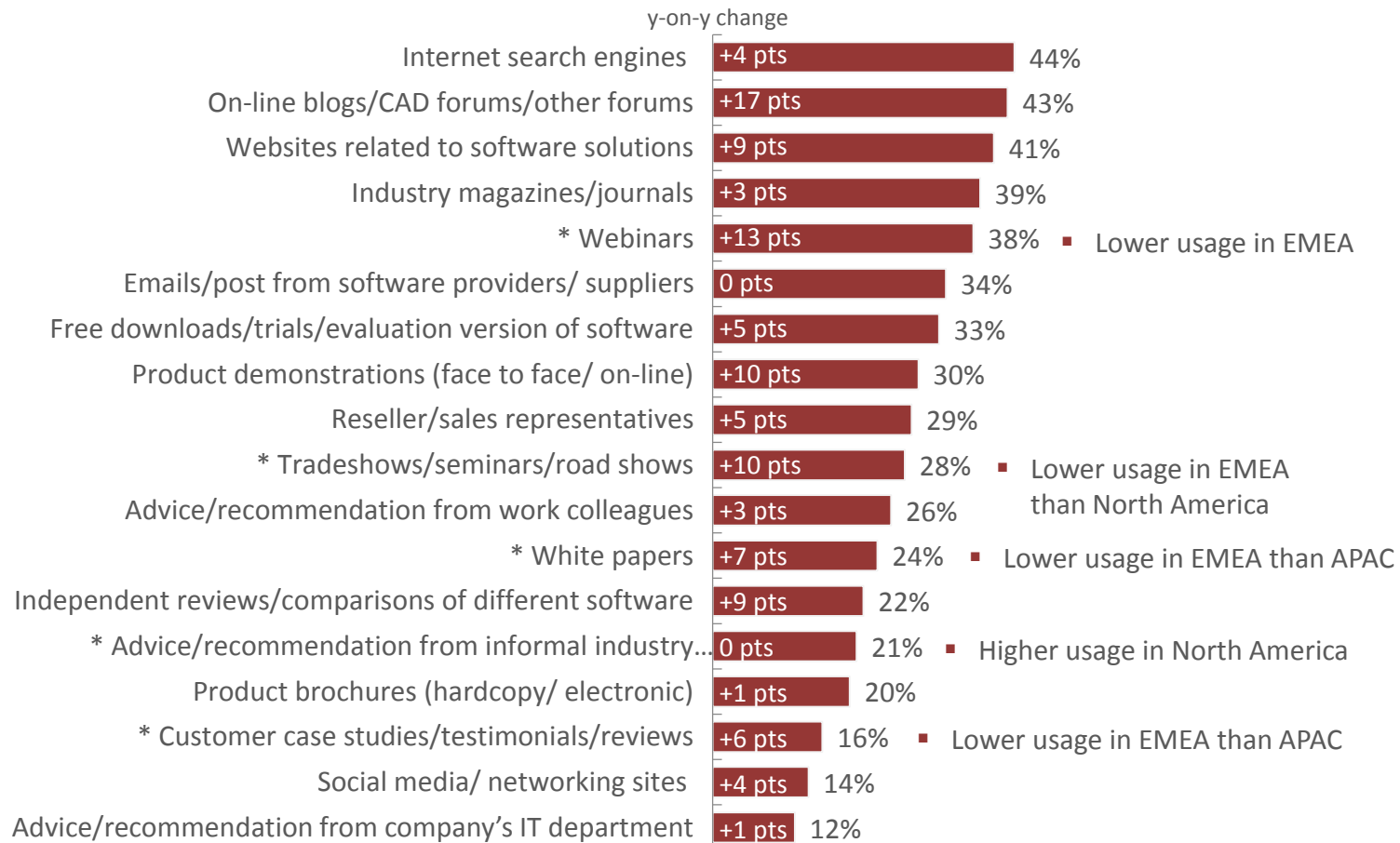
- Significant increase in the number of users downloading 3D Models regularly (10+ times/month)
- The increase is particularly driven by Manufacturing



Popular Sources of Information CAD Software



CAD TRENDS 2015



* Shows significant difference between regions @95% levels

KEY FACTS

- These are consolidated results for all job titles
- Favoured media differs considerably by job title - so marketing to reach senior managers, CAD managers or engineers should use different strategies
- Specifically, “Online blogs/CAD Forums/Other Forums” have seen the biggest gain in usage, followed by “Webinars”





Technical Survey Information

Appendices





Note on Analysis

YEAR-ON-YEAR SURVEY SAMPLE

- This study has been conducted in consecutive years. To ensure comparability and so that any changes in the results are true and not a result of different sample profiles, the 2015 CAD Trends data was adjusted by geographic region to be internationally representative and weighted by industry sector within the CAD market
- CAD Trend results were reviewed by individual sector and consolidated across all sectors. For the consolidated results, sectors within each tier were weighted equally:
 - Tier 1: AEC and Manufacturing
 - Tier 2: Process & Plant and Other
 - Tier 3: Education, Government and Utilities





Technical Survey Information

- In looking at future usage, we have made the assumption that current usage will continue, therefore future usage is an incremental addition to current usage
- All differences mentioned within the report are statistically significant at the 95% confidence level
- Weighting factors applied as follows:
 - Tier 1: AEC and Manufacturing – 34% weight
 - Tier 2: Process & Plant and Other – 10% weight
 - Tier 3: Education, Government and Utilities – 4% weight
- All bases shown in the report are un weighted – demonstrating the actual sample size, not its weighted equivalent



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