Contents

About The Business Advantage Group

- International B2B market research, data and business development consulting practice formed in 1992

- 30+ professional, multi/tri-lingual staff

- CAD/CAM, IT and High-Tech sector experience

- 2,000+ assignments successfully completed in over 100 countries
  - 800+ CAD/CAM/PLM/CAE projects
  - International experience and language skills
  - Database of 1,000,000 CAD decision-makers & users

- Specialists in provision of hybrid research and consulting solutions to solve complex business problems

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Market Research

- Market Sizing and Trends
- New Market Opportunities
- Segmentation
- Brand Positioning/Strategy
- Image and Awareness
- Competitor Analysis
- Channel Partner Research
- Product Development
- UX Research Recruitment

Data Services

- Building Databases
- Data Acquisition
- Cleansing and Enhancing
- Updating and Management
- Data Analysis and Profiling
- Data Provision

Consulting

- Corporate Strategies
- Marketing Strategies
- Distribution Strategies
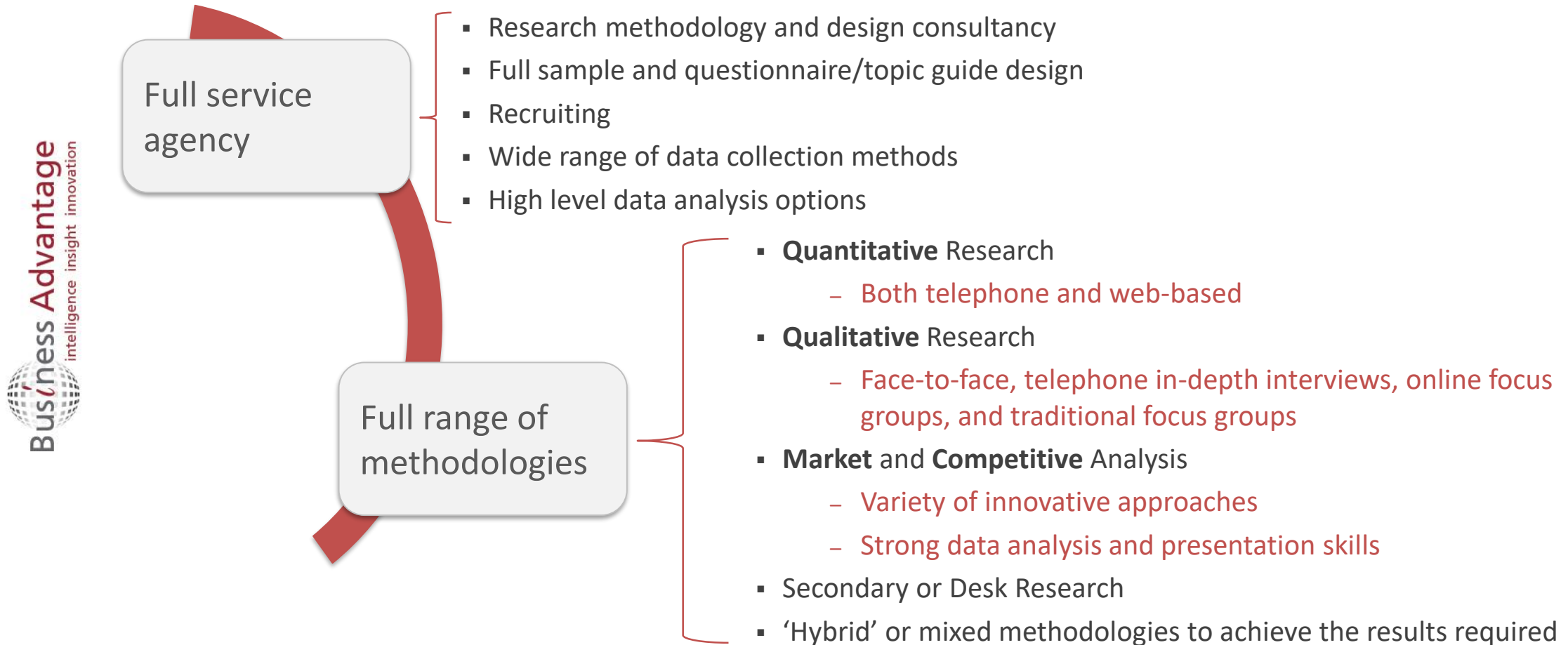- Customer Loyalty
- Mergers and Acquisitions

Sales Development

- Partner Recruitment
- In-depth Company Profiling
- Lead Generation
- Webinar Attendance
- Target Name Research
- Account Based Marketing

Business Advantage devises solutions to clients' business problems

- Strong business and marketing consultancy skills
- Provide highly actionable recommendations

Full service agency
- Research methodology and design consultancy
- Full sample and questionnaire/topic guide design
- Recruiting
- Wide range of data collection methods
- High level data analysis options

Full range of methodologies
- **Quantitative** Research
  - Both telephone and web-based
- **Qualitative** Research
  - Face-to-face, telephone in-depth interviews, online focus groups, and traditional focus groups
- **Market** and **Competitive** Analysis
  - Variety of innovative approaches
  - Strong data analysis and presentation skills
- Secondary or Desk Research
- 'Hybrid' or mixed methodologies to achieve the results required

INTRODUCTION AND METHODOLOGY

2018-19 CAD Trends

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 late 2018, allowing comparison with the survey results from the past 4 years
- Survey managed from our offices in London and San Francisco, drawing respondents from our in-house data repository of over 1,000,000 CAD/CAM users and decision makers and other data sources
- Sample of **626 CAD users & decision makers** across a range of company sizes and industries worldwide took part

Topics

- **16 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

Key Topics

16 Key CAD trends were identified for the survey this year – most of the topics as researched in previous years, 4 topics removed and 6 new requested topics are added

- A series of questions were asked about each of the 16 CAD trends to get a better understanding of <u>Awareness</u>, <u>Perceived Importance</u>, <u>Current and Future Usage</u>, <u>Benefits</u> and <u>more</u>

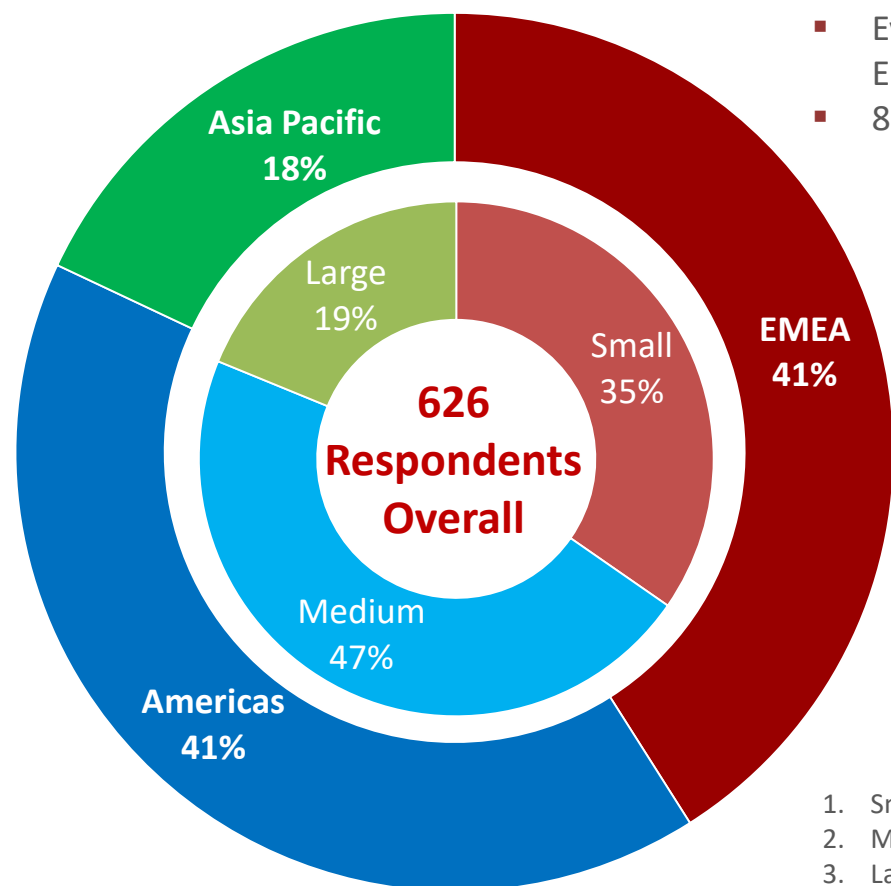| Q. Awareness	Q. Perceived Importance	Q. Current and Future Usage
Q: Which of the following leading trends are you familiar with or have heard of? *A prompted list was shown and respondents were asked to select all response options that apply*	Q: Thinking about your <u>core business functions</u>, to 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: 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?

CAD Trends 2018-19

We covered 16 CAD trends this year and these are shown below:

1. 3D Modelling

2. BIM (Building Information Modelling)

3. Cloud Based CAD

4. Mobile access to CAD (via laptops/tablets/mobile phones)

5. *Collaborative Design (team of people working on one design)

6. PLM (Product Lifecycle Management)

7. *Rendering (previously, advanced real-time rendering)

8. CAD Licensing Options

9. PDM (Product Data Management)

10. Augmented Reality (use of non-geometrical data to augment a CAD model view with direct or indirect physical, real-world environment)

11. 2D Drafting

12. CAM

13. *Virtual Reality (computer-generated experience taking place within a simulated environment)

14. *Machine Learning (an application of artificial intelligence (AI) that provides the ability for systems to automatically learn and improve from experience without being explicitly programmed)

15. *Artificial Intelligence (the simulation of intelligent behaviour in computers)

16. *Generative Design (use of software to generate optimum forms for products and buildings based on design parameters)
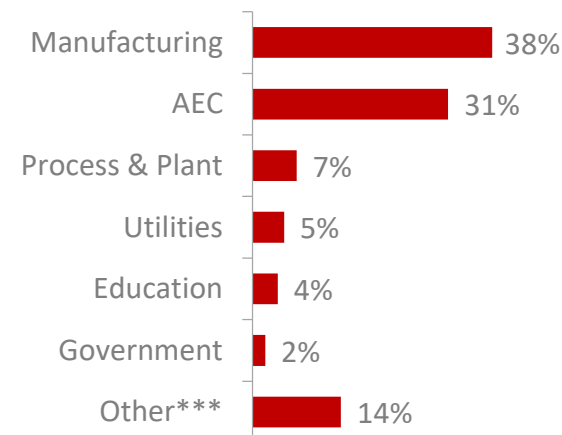
The Survey Audience N=626

Doughnut chart (outer ring):
- Asia Pacific 18%
- EMEA 41%
- Americas 41%

Doughnut chart (inner ring):
- Large 19%
- Small 35%
- Medium 47%

Center: 626 Respondents Overall

- Even split between EMEA & Americas
- 8 out of 10 are SMEs

1. Small (up to 50 employees)
2. Medium (51-1,000 employees)
3. Large (over 1,000 employees)

Respondents' Profile

Job Title

Managers *	35%
Engineers	25%
Designers	17%
Executive Management	13%
IT/IT Managers	1%
Other **	8%

- 35% of respondents are managers in their company

* CAD/Eng./Design/Tech./Project
** Include Architects, Technicians, Administrators and others

Sector

Manufacturing	38%
AEC	31%
Process & Plant	7%
Utilities	5%
Education	4%
Government	2%
Other***	14%
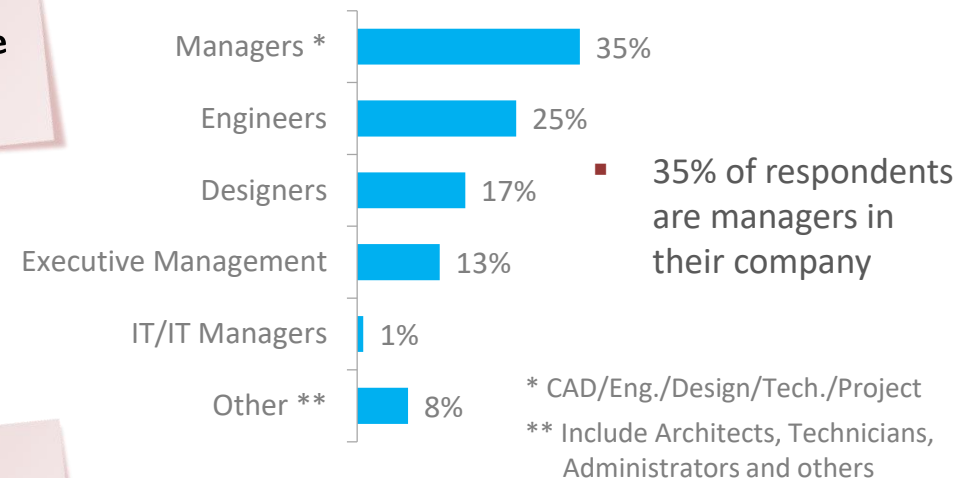
Key Trends Overview

Section One

Current Trends Snapshot: Adoption Ratio

CAD TRENDS 2018-19

2018-19 AWARENESS AND CURRENT USAGE

Average adoption ratio = 44%;

Trends with <u>above average</u> adoption - awareness translates to usage

Trends with <u>below average</u> adoption - awareness alone is not sufficient to drive usage – newer trends yet to accrue significant usage

Data sorted by adoption

Legend:
- Awareness (red)
- Usage (blue)
- Adoption ratio (line)

$\left[\dfrac{\% \text{ Usage}}{\% \text{ Aware}} \times 100 \right]$

Trend	Awareness	Usage
2D Drafting	73%	67%
3D Modelling	81%	69%
Rendering	63%	39%
Collaborative Design *	50%	29%
BIM	63%	36%
PDM	46%	26%
CAM	56%	31%
3D Printing	72%	31%
PLM	43%	18%
Mobile access to CAD	49%	19%
Generative Design	26%	8%
Cloud based CAD	53%	13%
Augmented Reality	39%	8%
Virtual Reality	54%	9%
Machine Learning	28%	3%
Artificial Intelligence	40%	3%

*Note: 'Collaborative Design' was introduced in 2018, in previous studies it was called 'Concurrent Engineering' with the same definition
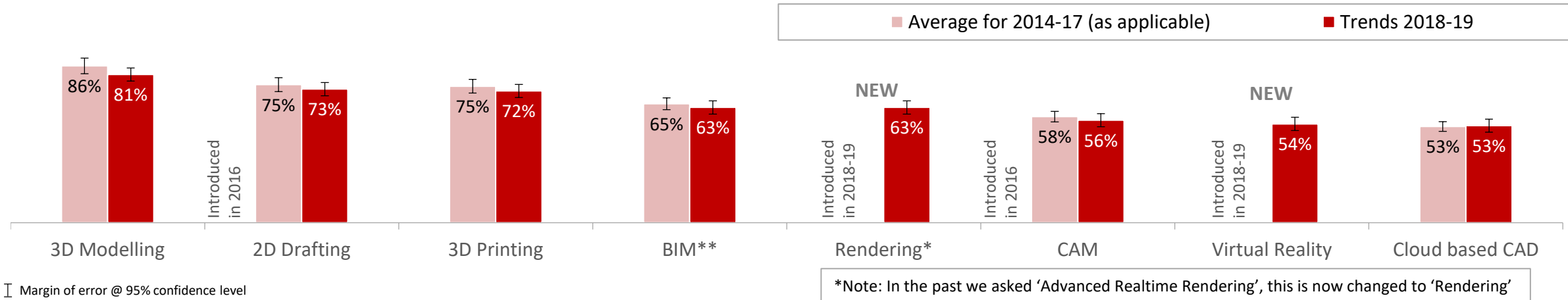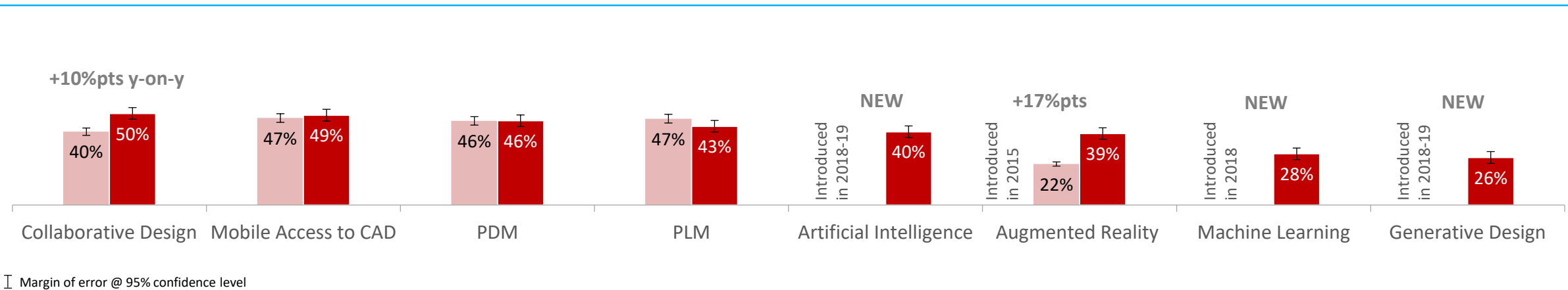
Q. Which of the following leading trends are you familiar with or have you heard of? (Base: Total Sample –626)
Q. Thinking about these trends again what do you/your company already use in-house at the moment? (Base: Total Sample – 626;)

Changes in **Awareness** Over Time

Note: Data sorted in descending order by Awareness in 2018-19

TOP 8 Trends

- Average for 2014-17 (as applicable)
- Trends 2018-19

	3D Modelling	2D Drafting	3D Printing	BIM**	Rendering*	CAM	Virtual Reality	Cloud based CAD
Average 2014-17	86%	75%	75%	65%	NEW (Introduced in 2018-19)	58% (Introduced in 2016)	NEW (Introduced in 2018-19)	53%
Trends 2018-19	81%	73%	72%	63%	63%	56%	54%	53%

2D Drafting Introduced in 2016

⊥ Margin of error @ 95% confidence level

Note: In the past we asked 'Advanced Realtime Rendering', this is now changed to 'Rendering'

Other Trends

	Collaborative Design	Mobile Access to CAD	PDM	PLM	Artificial Intelligence	Augmented Reality	Machine Learning	Generative Design
Label	+10%pts y-on-y				NEW	+17%pts	NEW	NEW
Average 2014-17	40%	47%	46%	47%	Introduced in 2018-19	22% (Introduced in 2015)	Introduced in 2018	Introduced in 2018-19
Trends 2018-19	50%	49%	46%	43%	40%	39%	28%	26%

⊥ Margin of error @ 95% confidence level

Q. Which of the following leading trends are you familiar with or have you heard of? (Base: Total Sample: 2014 – 409, 2015 – 635, 2016 – 610, 2017 – 720, 2018 – 626). ** based on industry sectors relevant to BIM

Changes in **Usage** Over Time

Note: Data sorted in descending order by Usage in 2018-19

TOP 8 Trends

Legend: ■ Average for 2014-17 (as applicable) ■ Trends 2018-19

- 3D Modelling: 74% / 69%
- 2D Drafting (Introduced in 2016): 70% / 67%
- Rendering (Introduced in 2018-19): **NEW** 39%
- BIM*: **=** 36% / 36%
- 3D Printing: **+6%pts** 25% / 31%
- CAM (Introduced in 2016): 27% / 31%
- Collaborative Design: **+12%pts** 17% / 29%
- PDM: 27% / 26%

⊺ Margin of error @ 95% confidence level

Other Trends

- Mobile Access to CAD: 18% / 19%
- PLM: 21% / 18%
- Cloud based CAD: 9% / 13%
- Virtual Reality (Introduced in 2018-19): **NEW** 9%
- Augmented Reality: 5% / 8%
- Generative Design (Introduced in 2018-19): **NEW** 8%
- Artificial Intelligence (Introduced in 2018-19): **NEW** 3%
- Machine Learning (Introduced in 2018-19): **NEW** 3%

⊺ Margin of error @ 95% confidence level

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Q. Thinking about these trends again what do you/your company already use in-house at the moment? (Base: Total Sample: 2014 – 409, 2015 – 635, 2016 – 610, 2017 – 720, 2018-19 – 626). * based on industry sectors relevant to BIM

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Current Trends – Importance Snapshot

CAD TRENDS IMPORTANCE RANKING 2018-19

Rank order

Most important to business

Rank	Trend
1	**3D Modelling (mean 8.6)**, *base n=506*
2	**2D Drafting (mean 8.2)**, *base n=455*
3	**PDM (mean 7.3)**, *base n=287*
4	**Collaborative Design (7.1)**, *base n=312*
5=	**BIM (mean 6.7)**, *base n=135*
5=	**PLM (mean 6.7)**, *base n=263*
7	**CAM (mean 6.6)**, *base n=344*
8	**Rendering (mean 5.8)**, *n=388*
9=	**Generative Design (mean 5.7)**, *base n=159*
9=	**Mobile Access to CAD (5.7)**, *base n=303*
11	**3D Printing (mean 5.0)**, *base n=440*
12=	**Machine Learning (mean 4.2)**, *base n=173*
12=	**Augmented Reality (mean 4.2)**, *base n=235*
12=	**Cloud Based CAD (mean 4.2)**, *base n=328*
15	**Virtual Reality (mean 4.0)**, *base n=329*
16	**Artificial Intelligence (mean 3.7)**, *base n=245*

Least important to business

- At an overall level, some CAD trends are more important to particular sectors, regions and company types…

  - **3D Modelling** in EMEA, Manufacturing and Large companies
  - **2D Drafting** in EMEA, AEC, and Small companies
  - **PDM** in APAC, Manufacturing, and Large companies
  - **Collaborative Design** in APAC, AEC, Large companies
  - **BIM** in APAC, AEC, and Large companies
  - **PLM** in EMEA, Manufacturing and Large companies
  - **CAM** in APAC, Medium companies, and Manufacturing
  - **Rendering** in APAC, AEC sector, and Large companies
  - **Mobile Access to CAD** in APAC, AEC and Large companies
  - **Generative Design** in APAC, Large companies, AEC and Other industry sectors
  - **3D Printing** in APAC, Large companies, Manufacturing and Other sectors
  - **Machine Learning** in APAC, Large companies, AEC and Other industry sectors
  - **Augmented Reality** in Large companies, and AEC and Other industry sectors
  - **Virtual Reality** in APAC, AEC and Other sectors, Large companies
  - **Cloud based CAD** in APAC, AEC and Large companies
  - **Artificial Intelligence** in APAC, Large companies, and Other industry sectors

Q. Thinking about your core business functions to what extent do you see each of these as an important trend to your company? Please answer using a scale of 1 to 10 where 1 means not at all important to your company and 10 means it is extremely important to your company. (Base: All aware of each CAD Trend gave an importance rating)
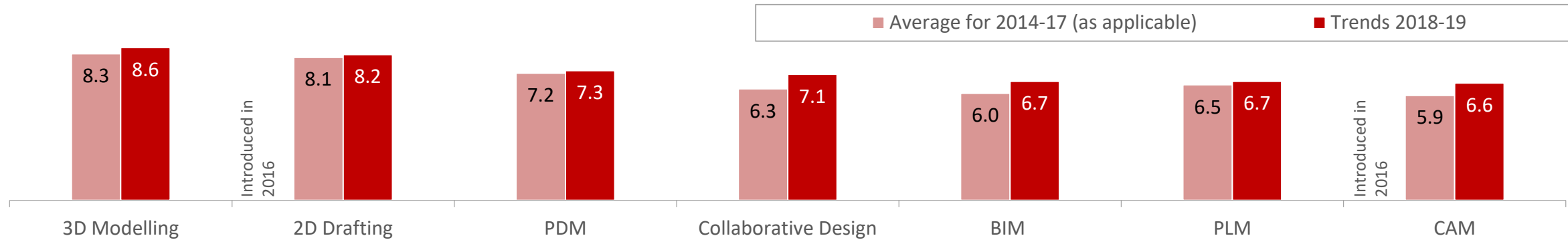
Absolute Importance Over Time

UPWARD Y-ON-Y TREND IN IMPORTANCE (MEAN SCORES) FOR MOST TRENDS
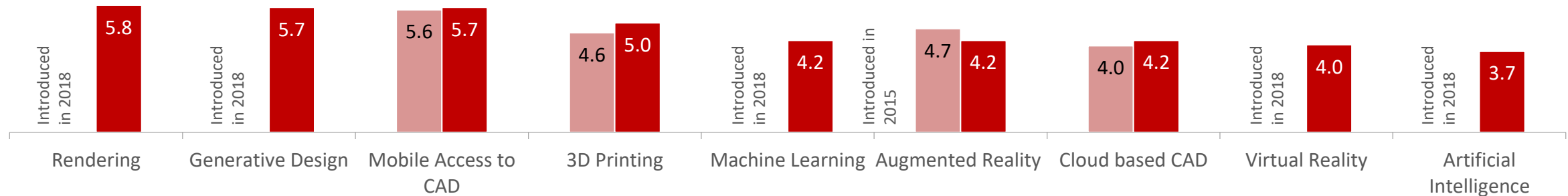### - COLLABORATIVE DESIGN, BIM AND CAM ARE SHOWING THE BIGGEST Y-ON-Y UPLIFT IN IMPORTANCE

Note: Data sorted in descending order by Absolute Importance mean scores in 2018-19

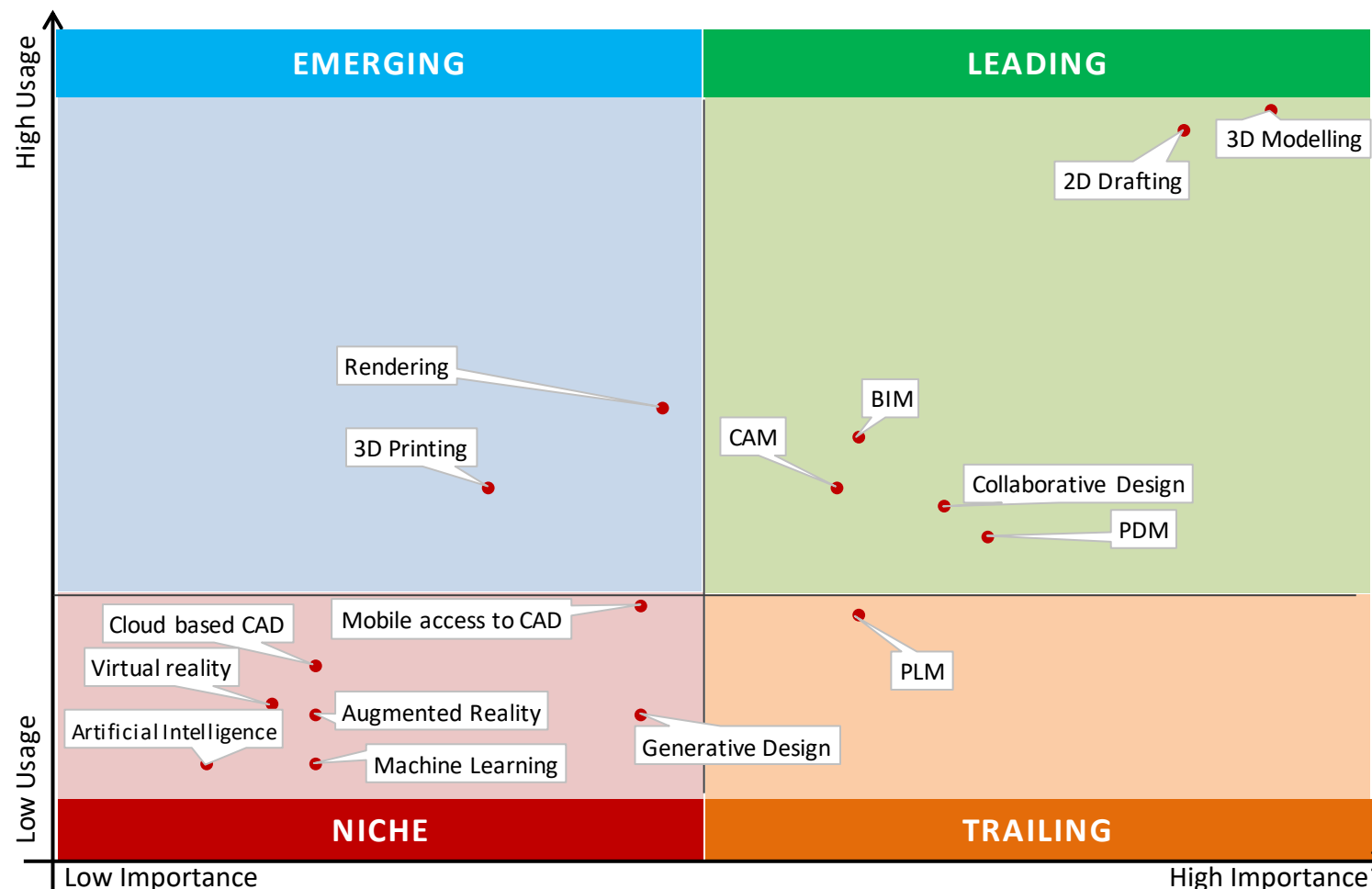**Legend:** ■ Average for 2014-17 (as applicable) ■ Trends 2018-19

TOP 7 Trends

Trend	Average for 2014-17	Trends 2018-19
3D Modelling	8.3	8.6
2D Drafting	8.1 (Introduced in 2016)	8.2
PDM	7.2	7.3
Collaborative Design	6.3	7.1
BIM	6.0	6.7
PLM	6.5	6.7
CAM	5.9 (Introduced in 2016)	6.6

Other Trends

Trend	Average for 2014-17	Trends 2018-19
Rendering	Introduced in 2018	5.8
Generative Design	Introduced in 2018	5.7
Mobile Access to CAD	5.6	5.7
3D Printing	4.6	5.0
Machine Learning	Introduced in 2018	4.2
Augmented Reality	4.7 (Introduced in 2015)	4.2
Cloud based CAD	4.0	4.2
Virtual Reality	Introduced in 2018	4.0
Artificial Intelligence	Introduced in 2018	3.7

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CAD TRENDS 2018-19

Snapshot of Usage and Importance

USAGE AND IMPORTANCE (TOTAL SAMPLE) 2018-19

- This chart plots perceived importance of trends against current usage

- The market is still strongly focused on 3D Modelling and 2D Drafting

- Growing significance of such technologies as BIM, CAM, and Collaborative Design

- Importance of BIM technology has increased compared to 2017

Looking to the Future

PREDICTED FUTURE USAGE (2018-19)

Strong growth potential from above average current usage for 3D Printing

Strong growth potential from below average current usage trends, for Mobile Access to CAD, Cloud based CAD, and Virtual Reality

Legend:
- Current usage
- Additional usage in 1year
- Additional usage in 3-5yrs

X-axis categories: 3D Modelling, 2D Drafting, Rendering, BIM, 3D Printing, CAM, Collaborative Design, PDM, Mobile access to CAD, PLM, Cloud based CAD, Virtual Reality, Augmented Reality, Generative Design, Artificial Intelligence, Machine Learning

Q. Thinking about these trends again what do you/your company already use in-house at the moment? Q. Which of these do you/your company plan on using in-house within the next 12 months? / … within the next 3-5 years? Base: Total Sample – 626

Diagnostics on Current Usage & Future Potential

2018-19 CAD Trends ranked by future growth potential – additional analysis in sectors with appreciable differences in current/future usage

Mapping Future Potential

- In order to identify opportunities in the CAD market, our focus turns to <u>ranking</u> trends by their <u>growth potential over the next 5 years</u>

- Trends which are currently the most important to users are reaching market saturation, as they have very high current usage and therefore relatively little scope to further expand their reach

- So although current usage and perceived importance are still relatively low for what have been termed the more "niche" trends, they are where the future growth lies

- The following slides explore these trends in order of their growth potential ratio over the next 3-5 years, whilst also highlighting where they sit in the importance rankings

Mapping Future Potential

GROWTH POTENTIAL (2018-19)

Average growth ratio = 88%

$$\text{Growth Potential Ratio} = \left[\frac{\text{\% Using in 3-5 yrs. - \% Using now}}{\text{\% Using Now}} \right] \times 100$$

■ Growth Potential (Total Sample)

Strongest growth potential in new and emerging technologies

Lower growth potential in trends which, although important in the market, are reaching market saturation

Technology	Growth Potential
Machine Learning	250%
Artificial Intelligence	243%
Virtual Reality	172%
Augmented Reality	143%
Cloud based CAD	138%
Generative Design	100%
Mobile access to CAD	87%
PLM	62%
3D Printing	54%
PDM	41%
Collaborative Design	37%
BIM	33%
Rendering	25%
CAM	18%
3D Modelling	9%
2D Drafting	3%

Machine Learning

**2018-19 IMPORTANCE MEAN SCORE 4.2
CURRENT USAGE 3%**

Lowest current usage & low importance, highest future growth potential across all trends

3%

6%

11%

Use now in-house
2018-19

Use now, and plan to use in-house within 1 year

Use now, and plan to use in-house within 3-5 years
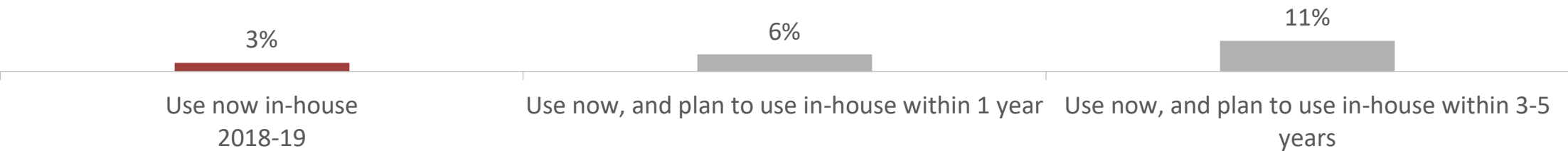
KEY FACTS

Observation: Machine learning is a niche trend which was added in 2018-19. It has the 2nd highest growth potential; however, the current usage and importance are low.

Sectors: Slightly higher usage across APAC and large companies.

Forecast: The use of Machine Learning is predicted to double in the next 12 months and by over 250% over the next 3-5 years – strong future potential will be driven by Americas, APAC and large companies.

Benefits: Key benefits among those using/planning to use Machine Learning are: 'improved equipment effectiveness' (57%), 'increase in production capacity/yields' (50%), 'improved preventative maintenance' (51%), 'reduction of material consumption' (39%), 'consumption of unlimited amounts of data with timely analysis and assessment' (36%), 'optimization of supply chains and creating greater economies of scale' (34%).

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Base: Importance score is based on all aware of this particular CAD Trend in 2018-19 –173
Base: Usage score is based on everybody (Total Sample: 2018-19 – 626)

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Artificial Intelligence

2018-19 IMPORTANCE MEAN SCORE 3.7
CURRENT USAGE 3%

Lowest current usage & importance, but very high future growth potential

3%	6%	11%
Use now in-house 2018-19	Use now, and plan to use in-house within 1 year	Use now, and plan to use in-house within 3-5 years
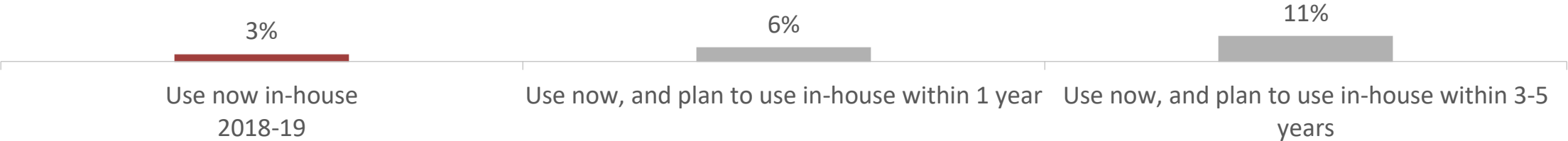
KEY FACTS

Observation: This trend is a niche and new trend this year. Artificial Intelligence has the highest growth potential; however, at the moment current usage and importance are at the lowest level.

Sectors: Significantly higher current usage in APAC. Large companies are also much more likely to be using this trend at present

Forecast: AI usage is predicted to double in the next year and grow almost 4 times over the next 3-5 years – this is driven by APAC and large companies.

Benefits: Among those using/planning on using AI, the top mentioned benefits include 'speeding up processes' (61%), 'improved productivity' (61%), and 'ensured accuracy' (54%); other benefits include, 'improved demand forecasting' (51%), 'preventative maintenance' (49%), 'automated quality control' (46%), 'automated failure alerts' (39%), and 'reduction in staff' (29%).

Base: Importance score is based on all aware of this particular CAD Trend in 2018-19 –245
Base: Usage score is based on everybody (Total Sample: 2018-19 – 626)

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CAD TRENDS
2018-19

Virtual Reality

CAD TRENDS
2018-19

2018-19 IMPORTANCE MEAN SCORE 4.0
CURRENT USAGE 9%

Very low current usage & importance, but very strong future potential

9%

Use now in-house
2018-19

15%

Use now, and plan to use in-house within 1 year

25%

Use now, and plan to use in-house within 3-5 years
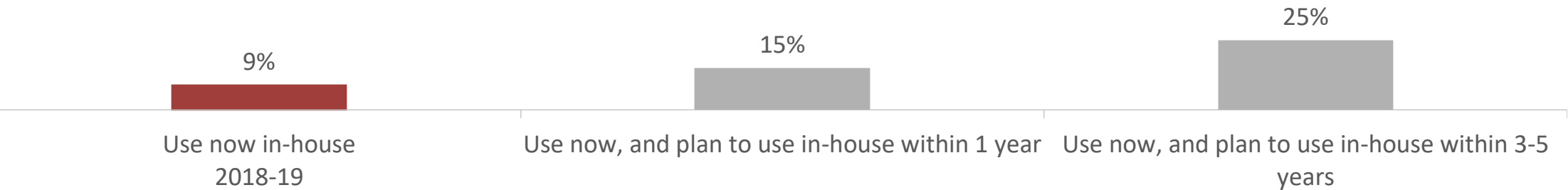
KEY FACTS

Observation: Virtual Reality is a new and niche trend this year. The current usage and importance are low; however, it ranks 3rd in growth opportunity.

Sectors: Higher current usage is reported in Americas and APAC, and large companies.

Forecast: Virtual Reality is predicted to grow by over 175% in the next 3-5 years – this will be driven by APAC and large companies.

Benefits: Among those using/planning to use VR, 'communicating design intent to clients' is mentioned as the main benefit (64%), followed by 'help with education/training' (53%), 'help with marketing/sales' (46%), and 'better/faster design creation' (41%) and 'unique competitive advantage to win more business' (22%).

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Base: Importance score is based on all aware of this particular CAD Trend in 2018-19 –329
Base: Usage score is based on everybody (Total Sample: 2018-19 –626)

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Current Usage of Virtual Reality

BREAKDOWN OF CURRENT USAGE

Usage of VR by Region

31%
34.5%
34.5%

APAC   Americas   EMEA

Usage of VR by Company Size

17%
43%
40%

Large   Medium   Small

Usage of VR by Industry Sector

24%
50%
26%

Manufacturing   AEC   Other
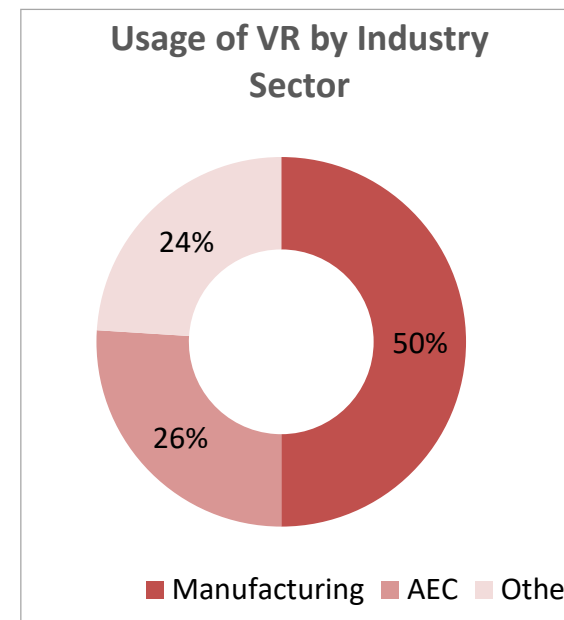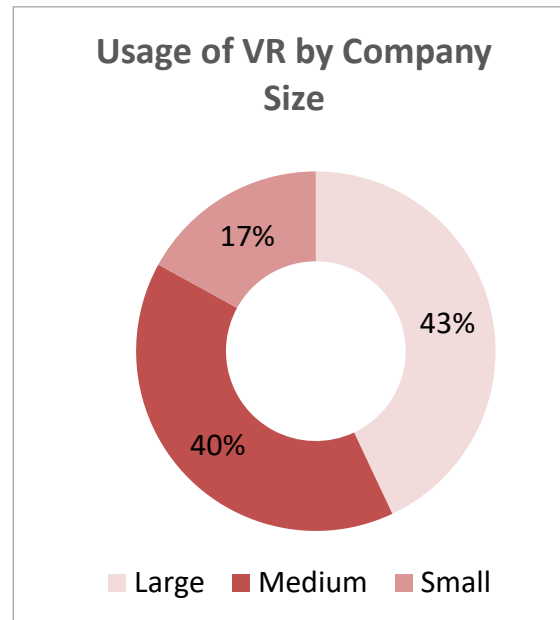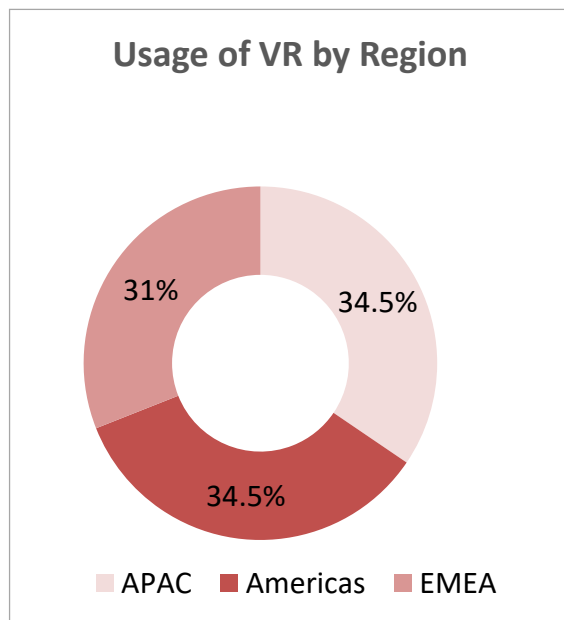
*Based on those using Virtual Reality (n=58)

Usage: Usage of Virtual Reality is higher in APAC and Americas, and among Manufacturing and large companies.

Augmented Reality

2018-19 IMPORTANCE MEAN SCORE 4.2
CURRENT USAGE 8%

Very low current usage & importance, but strong future potential

5%	8%	13%	19%
Average for 2015-17	Use now in-house 2018-19	Use now, and plan to use in-house within 1 year	Use now, and plan to use in-house within 3-5 years
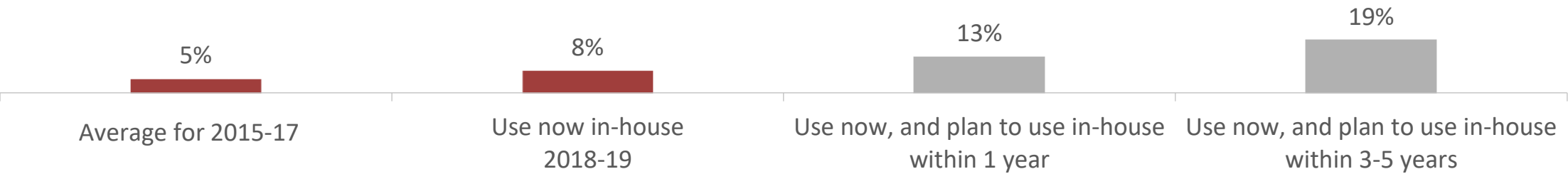
KEY FACTS

Observation: Augmented Reality is a niche trend with relatively low importance and low usage.

Sectors: APAC and large companies are much more likely to be using AR at present.

Forecast: Future growth predictions are strong, but from a low base level of current usage. Large companies are significant more likely to be driving the potential use in the next 3-5years.

Benefits: Among those using/planning to use this trend, the perceived benefits are: 'communicating design intent to clients' (51%), 'real time visualization' (49%), 'better communication/collaboration' (42%), 'help with marketing/sales' (38%), 'better/faster design creation' (35%), 'help with education/training' (34%).

Base: Importance score is based on all aware of this particular CAD Trend in 2018-19 –235
Base: Usage score is based on everybody (Total Sample: 2014 – 409, 2015 – 635, 2016 – 610, 2017 – 720, 2018-19 - 626)

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Cloud Based CAD

CAD TRENDS
2018-19

2018-19 IMPORTANCE MEAN SCORE 4.2
CURRENT USAGE 13%

Low current usage & importance, but high future growth potential

9%
Average for 2014-17

13%
Use now in-house 2018-19

20%
Use now, and plan to use in-house within 1 year

30%
Use now, and plan to use in-house within 3-5 years
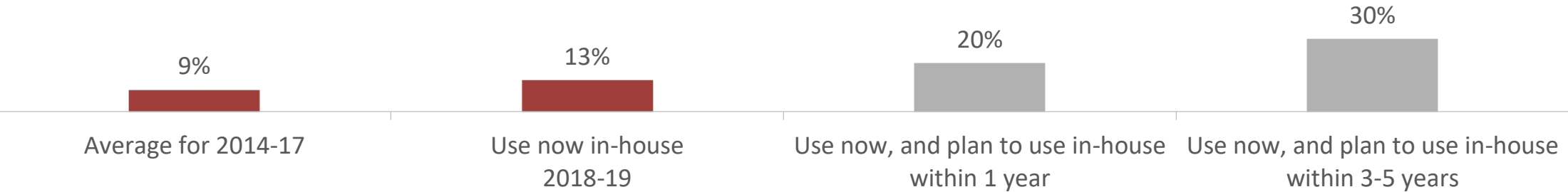
KEY FACTS

Observation: Cloud based CAD is a niche trend, it has stable and low usage and importance – although there are indications for strong future growth.

Sectors: APAC and large companies are more likely to be using Cloud based CAD.

Use cases: Over half (53%) of those using/planning to use Cloud based CAD, use it for exchange or collaboration, 46% use it for reviewing CAD design files, 45% for storage and backup of CAD files, and about a third are designing using CAD in the Cloud.

Forecast: Good future predicted growth potential, particularly in the longer term of 3-5 years. The growth is likely to be driven by large companies.

Benefits: Among those using/planning to use this trend, the perceived benefits of Cloud based CAD are 'higher mobility' (60%), 'ease of updating software' (38%), 'cost reductions' (34%), 'increased storage capacity' (31%), 'better scalability' (26%) and 'access to agile and adaptive infrastructure' (25%).

Base: Importance score is based on all aware of this particular CAD Trend in 2018-19 –328
Base: Usage score is based on everybody (Total Sample: 2014 – 409, 2015 – 635, 2016 – 610, 2017 – 720, 2018-19 - 626)

Cloud based CAD

Use/Planned Use of Cloud based CAD

How are you using/planning to use Cloud based CAD in your organisation?

Only around 1 in 5 are using Cloud based CAD as their primary CAD program

Legend: ■ Total Sample

- 56% — For exchange or collaboration of CAD files
- 47% — For review of CAD design files
- 45% — For storage and backup of CAD files
- 33% — For design using CAD hosted in the Cloud
- 28% — For adding data to existing CAD drawings
- 24% — For building models of individual parts
- 24% — For building entire assembly models
- 23% — As our primary CAD program
- 12% — Don't know/cannot say

Cloud based CAD (Contd...)

Benefits of Cloud based CAD

What benefits and productivity changes have you achieved/plan on achieving?

Legend: ■ Total Sample

- Higher mobility - can access from anywhere: 60%
- Ease of software updates: 38%
- Reduce costs: 34%
- Increased storage capacity: 31%
- Better scalability: 26%
- Access to agile and adaptive infrastructure: 25%
- Control over security: 23%
- Control over compliance: 21%
- Don't know/cannot say: 13%
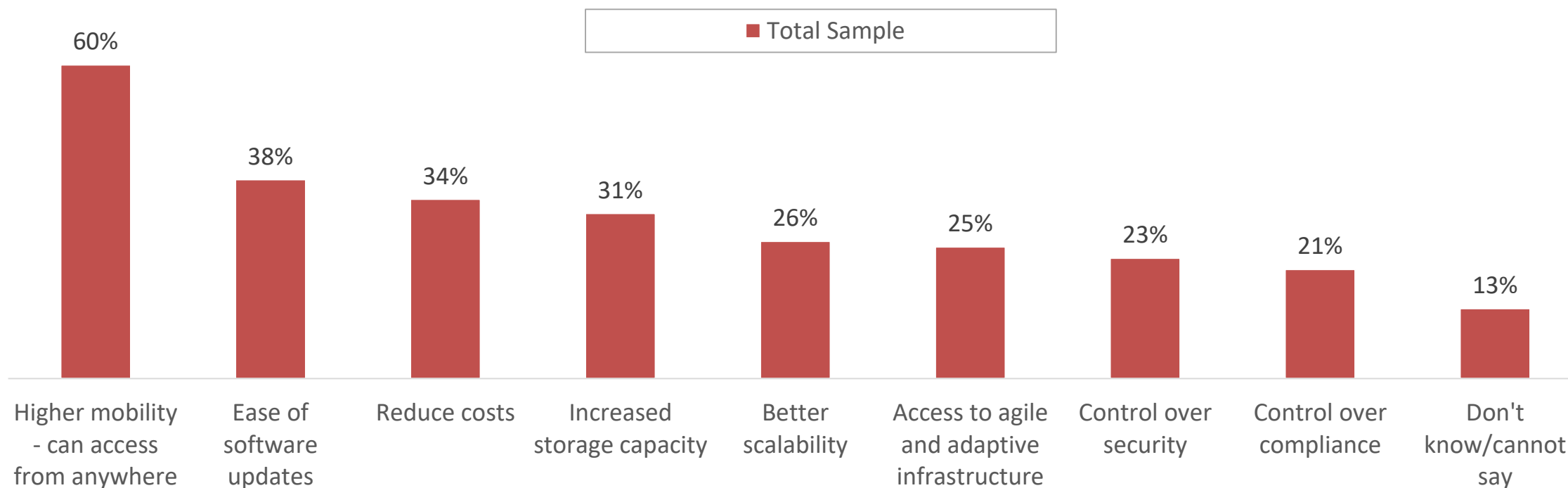
Generative Design

2018-19 IMPORTANCE MEAN SCORE 5.7
CURRENT USAGE 8%

Very low current usage & importance, but good future growth potential

8%	13%	16%
Use now in-house 2018-19	Use now, and plan to use in-house within 1 year	Use now, and plan to use in-house within 3-5 years
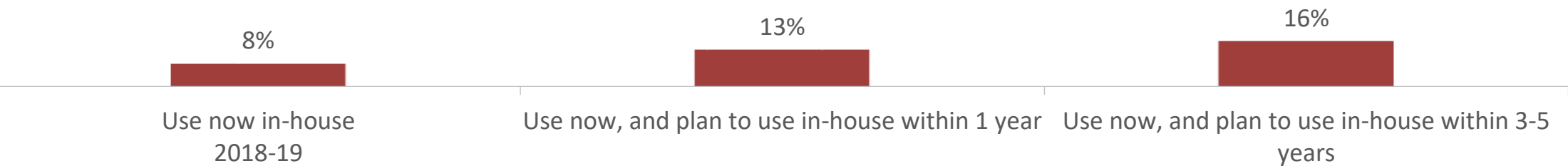
KEY FACTS

Observation: This is a new and niche trend. Generative Design has low level of current usage and importance. The future growth potential is promising.

Sectors: Present usage is higher in APAC, for large companies.

Forecast: The use of Generative Design is predicted to double over the next 3-5 years. This increase is evident across the Manufacturing sector and large companies.

Benefits: Among those using/planning to use this trend, the key benefits include 'optimising performance criteria of the design' (66%), 'quick generation of alternative designs' (63%), 'optimise the materials and manufacturing methods' (48%), 'minimising waste and reducing material cost' (41%), 'reduces the number of physical prototypes required' (38%).

Base: Importance score is based on all aware of this particular CAD Trend in 2018-19 –159
Base: Usage score is based on everybody (Total Sample: 2018-19 - 626)

30

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Mobile Access to CAD

CAD TRENDS
2018-19

**2018-19 IMPORTANCE MEAN SCORE 5.7
CURRENT USAGE 19%**

Below average current usage, average importance but reasonable future potential growth

18%	19%	28%	36%
Average for 2014-17	Use now in-house 2018-19	Use now, and plan to use in-house within 1 year	Use now, and plan to use in-house within 3-5 years
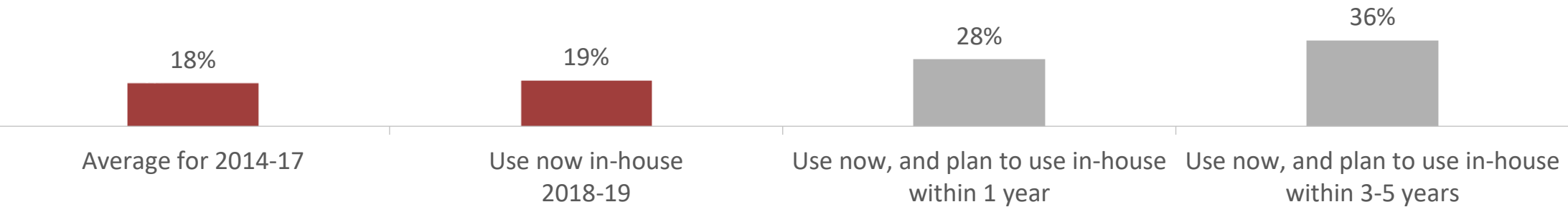
KEY FACTS

Observation: This is a niche trend. The usage is stable compared to the average across previous years, but the future looks promising.

Sectors: The current usage is particularly higher in the Americas and for large companies.

Forecast: Predicted future growth is at average levels. The Americas, and large companies will drive the growth over the next 3-5 years.

Usage: Among companies using/planning to use Mobile Access to CAD, a vast majority (80%) are using this trend to view/annotate CAD files, followed by 35% to create CAD files. Mobile access to CAD is primarily used to enable collaboration in these companies (67%).

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Base: Importance score is based on all aware of this particular CAD Trend in 2018-19 –303
Base: Usage score is based on everybody (Total Sample: 2014 – 409, 2015 – 635, 2016 – 610, 2017 – 720, 2018-19 - 626)

31

Mobile Access to CAD

Majority are using Mobile for viewing CAD files, around 1 in 3 are using Mobile to create files

How do people in your organisation use/plan to use mobile access to CAD?
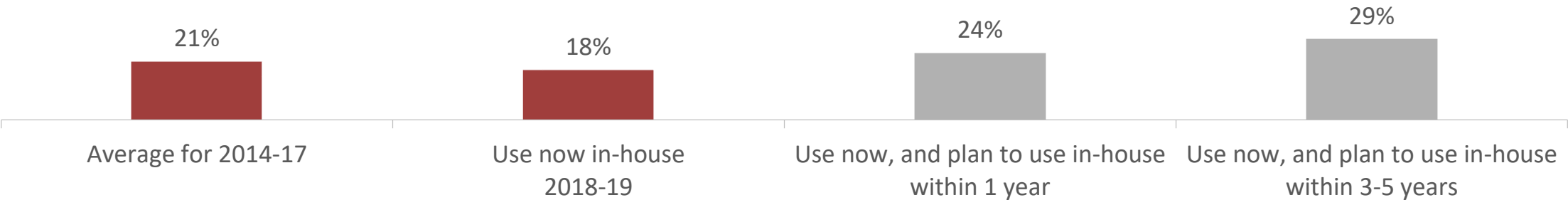
- Total Sample

Category	Value
As a user of (viewing, annotating, etc.) CAD files	80%
As an author of (creating) CAD files	35%
Don't know/cannot say	6%
Other	1%
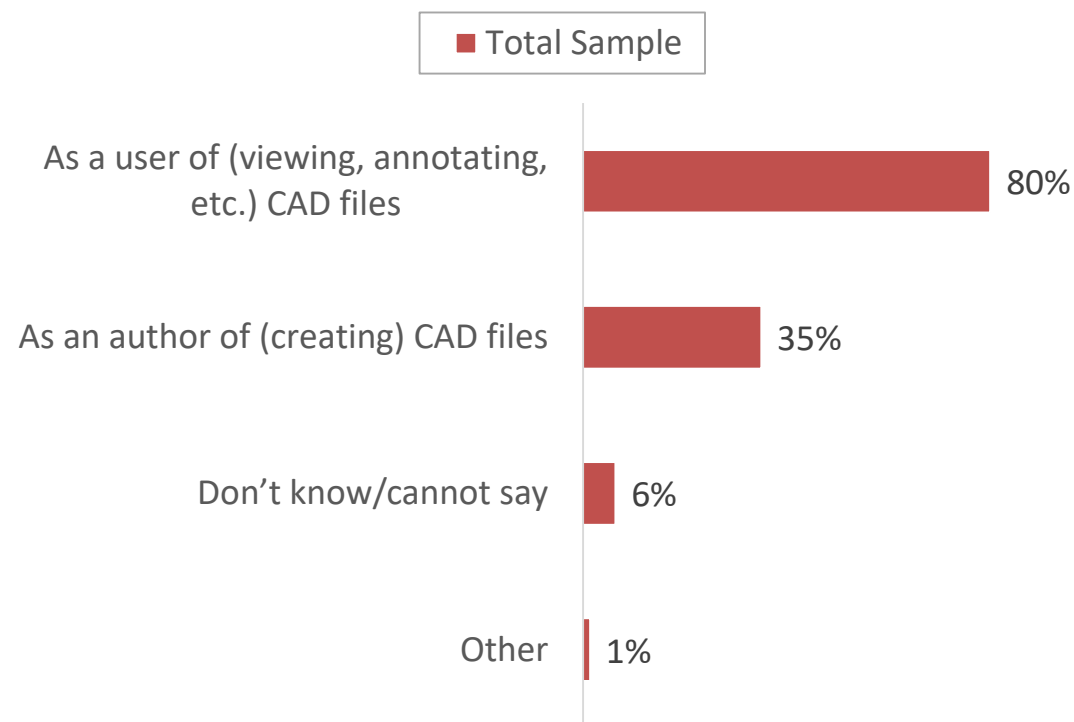
Is mobile access used/planned for collaboration in your organisation?
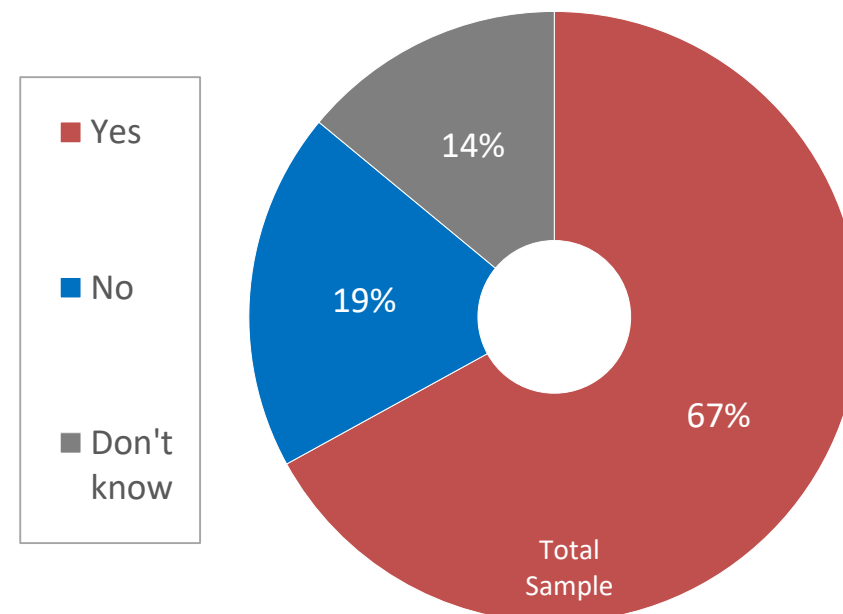
- Yes
- No
- Don't know

Yes 67%
No 19%
Don't know 14%
Total Sample

Q. How do people in your organisation use/plan to use mobile access to CAD (e.g. smartphone, tablet or laptop)? All using/planning to use mobile access to CAD 221

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Product Lifecycle Management (PLM)

CAD TRENDS
2018-19

2018-19 IMPORTANCE MEAN SCORE 6.7
CURRENT USAGE 18%

Average current usage and growth potential but slightly higher importance

21%	18%	24%	29%
Average for 2014-17	Use now in-house 2018-19	Use now, and plan to use in-house within 1 year	Use now, and plan to use in-house within 3-5 years

KEY FACTS

Observation: PLM is a trailing trend; however, it has the potential to be a growth area in today's market, with above average importance.

Sectors: Current usage is significantly higher, as expected, in Manufacturing and large companies.

Forecast: An increase in the usage is predicted over the next 3-5 years, this will be driven by the Manufacturing sector, and large companies.

Software: Among the users/potential users of this trend, PTC Windchill (20%) and Siemens Teamcenter (18%) are the main software tools used, although 27% do not know what they use/plan to use.

Benefits: Perceived benefits mentioned by users/planned users of this trend are 'savings on design time' (54%), 'design improvements' (52%), 'cost savings' (41%), and 'faster time to market' (41%).

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Base: Importance score is based on all aware of this particular CAD Trend in 2018-19 –263
Base: Usage score is based on everybody (Total Sample: 2014 – 409, 2015 – 635, 2016 – 610, 2017 – 720, 2018-19 - 626)

33

3D Printing

CAD TRENDS
2018-19

2018-19 IMPORTANCE MEAN SCORE 5.0
CURRENT USAGE 31%

Good level of current usage, lower importance and below average future potential

| 25% | 31% | 38% | 48% |
| Average for 2014-17 | Use now in-house 2018-19 | Use now, and plan to use in-house within 1 year | Use now, and plan to use in-house within 3-5 years |
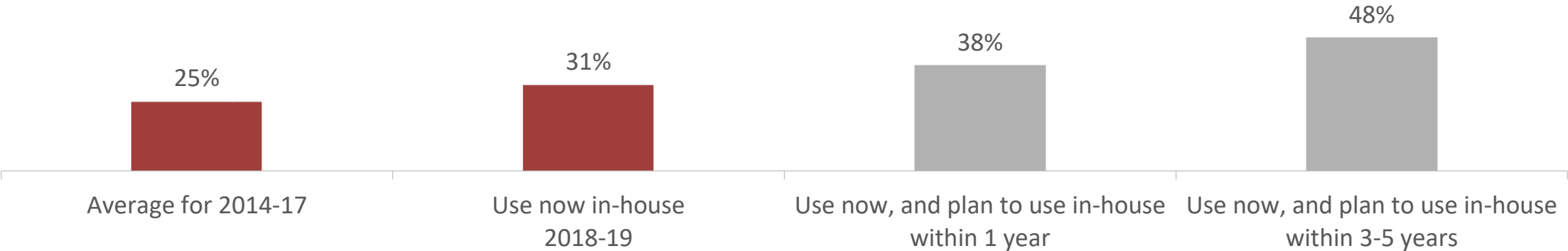
KEY FACTS

Observation: This is an emerging trend. There is a consistent increase in the usage over time for this trend.

Sectors: Higher usage in Americas, Manufacturing and Other industry sectors and large companies.

Forecast: Predicted future growth potential is below average. Manufacturing, non-AEC industry sectors and large companies will drive this increase in future usage.

Current Use: 1 in 4 (25%) of those using/planning to use 3D Printing use 3D Systems, 19% use Stratasys and 16% use Makerbot. 3D Printers are generally used by this audience for prototyping (80%) followed by research and design (68%). 64% of those using 3D Printing reported an increase in usage over the last 12 months, while in 28% of companies usage stayed the same.

Benefits: The reported benefits (among those using/planning to use) of 3D printing are 'design improvements' (68%), 'savings on design time' (53%), 'faster response time to market' (46%) and 'savings on costs' (40%).

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Base: Importance score is based on all aware of this particular CAD Trend in 2018-19 –440
Base: Usage score is based on everybody (Total Sample: 2014 – 409, 2015 – 635, 2016 – 610, 2017 – 720, 2018-19 - 626)

34

CAD TRENDS
2018-19

Product Data Management (PDM)

2018-19 IMPORTANCE MEAN SCORE 7.3
CURRENT USAGE 26%

Above average current usage & high importance, but modest growth potential

27%	26%	31%	36%
Average for 2014-17	Use now in-house 2018-19	Use now, and plan to use in-house within 1 year	Use now, and plan to use in-house within 3-5 years
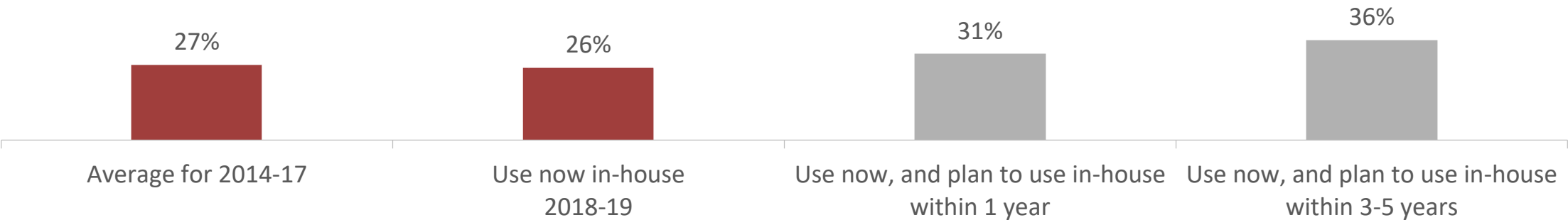
KEY FACTS

Observation: PDM is one of the leading trends, with good level of current usage and high importance.

Sectors: Significantly higher current usage in the Americas, Manufacturing sector and among large companies.

Forecast: Some future growth is predicted, this is likely to be driven by the Americas, the Manufacturing sector and large companies.

Reasons: Among those using/planning to use this trend, 59% typically use PDM for data storage/organisation and for collaboration on design files; 26% use PDM just to store and to organise data associated with a design file.

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Base: Importance score is based on all aware of this particular CAD Trend in 2018-19 –287
Base: Usage score is based on everybody (Total Sample: 2014 – 409, 2015 – 635, 2016 – 610, 2017 – 720, 2018-19 - 626)

35

Collaborative Design

2018-19 IMPORTANCE MEAN SCORE 7.1
CURRENT USAGE 29%

Good current usage, quite high importance, but growth potential below average

Note: Trend 'Collaborative Design' was introduced in 2018, in previous studies it was called 'Concurrent Engineering'.

17%
Average for 2014-17

29%
Use now in-house 2018-19

34%
Use now, and plan to use in-house within 1 year

39%
Use now, and plan to use in-house within 3-5 years
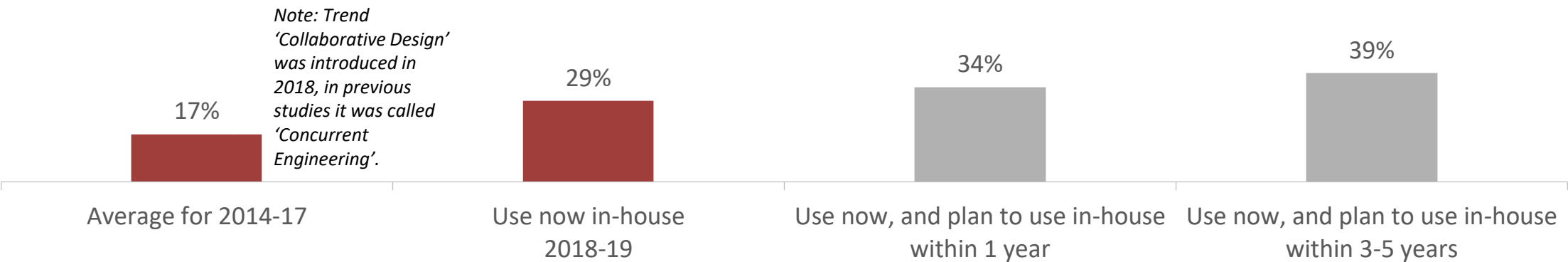
KEY FACTS

Observation: Collaborative Design (previously called Concurrent Engineering) is a leading trend in today's market, with above average importance and usage ratings.

Sectors: The current usage is higher in the Americas, Manufacturing sector and especially large companies.

Forecast: The future usage growth potential in 3-5 years is below average, at 39%. The Americas, Manufacturing sector and large companies will drive this future increase in usage of Collaborative Design.

Benefits: Among the users/planned users, the benefits of using this trend are: 'speed up design time' (60%), followed by 'reduction of errors and clashes' (59%), 'improvements in designs' (49%), 'savings on cost' (44%), 'ability for designers to be based in multiple locations' (42%).

Building Information Modelling (BIM)

2018-19 IMPORTANCE MEAN SCORE 6.7
CURRENT USAGE 36%

Above average current usage and importance, and good future potential

36%	36%	44%	48%
Average for 2014-17	Use now in-house 2018-19	Use now, and plan to use in-house within 1 year	Use now, and plan to use in-house within 3-5 years
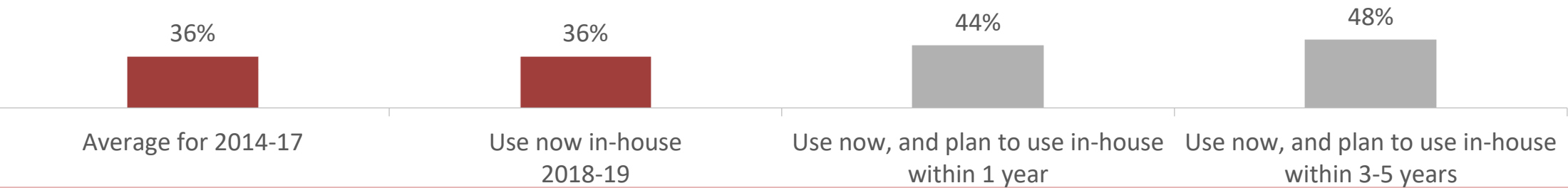
KEY FACTS

Observation: BIM is a leading trend, with a good growth potential.

Sectors: The current usage of BIM is highest in EMEA and for medium to large companies.

Software: Among the users/planned users of BIM, Autodesk Revit is the most used product (57%), followed by AutoCAD Architecture (33%) and Navisworks (25%).

Adoption: There are a number of reasons for adopting BIM among the users/planned users of BIM, these include: identify problems earlier/clash detection (33%), speed up design/reuse designs (31%), remain competitive (30%), expected efficiency gains (30%), improved communication/collaboration (23%), and demand from customers (23%).

Forecast: Understandably, the AEC sector is likely to drive this increased usage in the next 12 months. EMEA and medium to large companies are likely to drive the increase in usage in the next 3-5 years.

Benefits: Benefits of using BIM (among users/planned users of BIM) are seen as 'reduction of errors in design' (55%), 'improved collaboration' (39%) and 'improved design' (39%), 'savings on costs' (32%), 'faster response times to market' (26%), and 'savings on design time' (26%) *(based on those in the relevant industry sectors).*

Base: Importance score is based on all aware of this particular CAD Trend in 2018-19 –132
Base: Usage score is based on relevant industry sectors only

37

Rendering

CAD TRENDS 2018-19

2018-19 IMPORTANCE MEAN SCORE 5.8
CURRENT USAGE 39%

Very good current usage, above average importance, but limited future potential

39%
Use now in-house
2018-19

44%
Use now, and plan to use in-house within 1 year

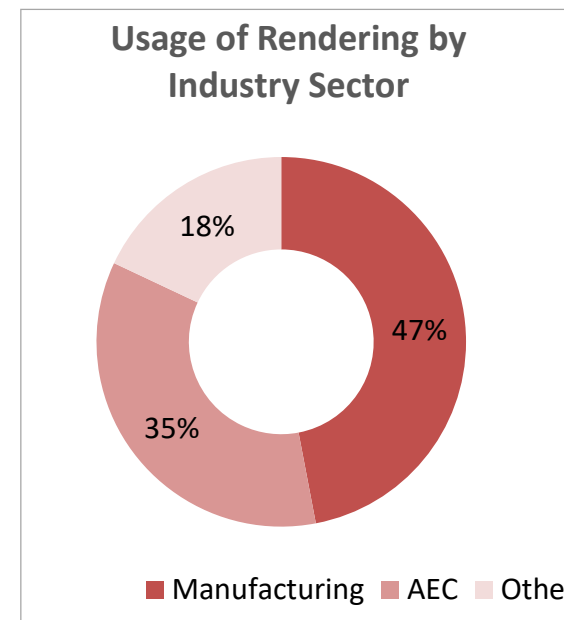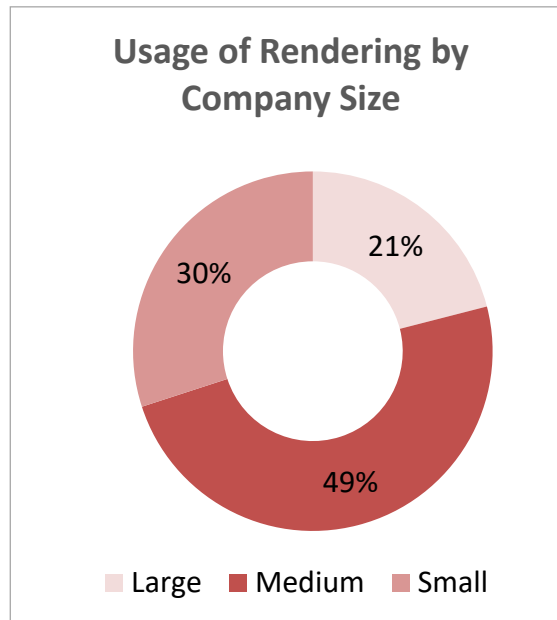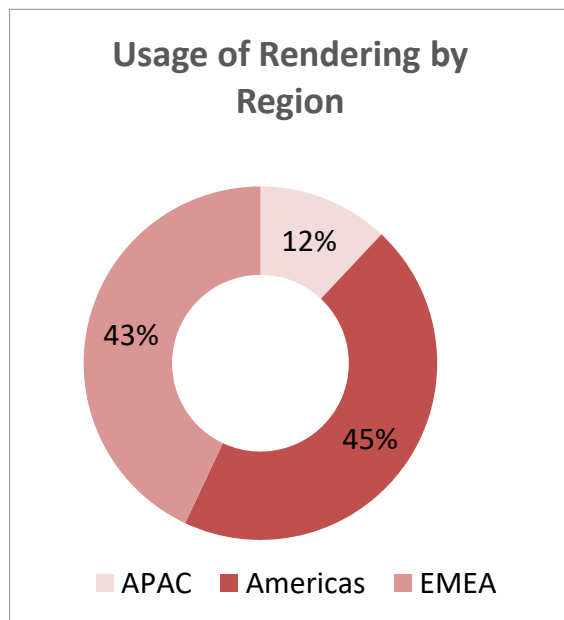49%
Use now, and plan to use in-house within 3-5 years
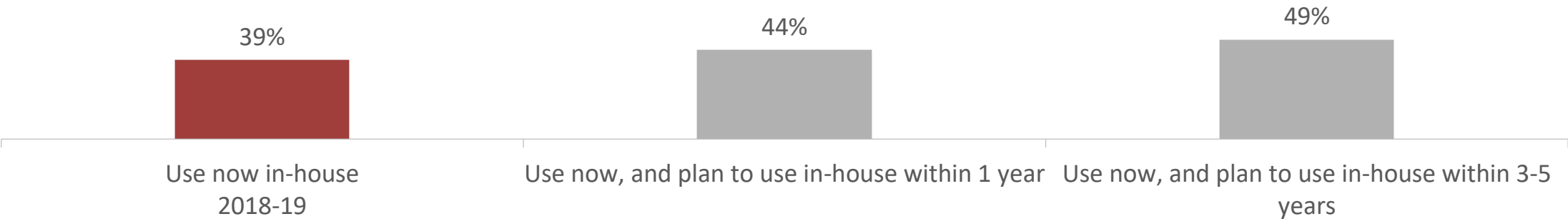
KEY FACTS

Observation: This is a new and emerging trend this year. Although Rendering is widely used, it's importance is average and potential growth is limited.

Sectors: Current usage is high for large companies.

Usage: Among those using/planning to use this trend, majority undertake rendering work on their workstations (70%), other users do it either on on-premise servers (21%) or in the cloud (21%). Rendering is primarily used for design reviews, collateral for customers (46%), to help in-house design (29%), for AR (9%) and virtual reality (8%).

Forecast: There is a small amount of room for growth over the next 3-5 years – driven by large companies.

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Base: Importance score is based on all aware of this particular CAD Trend in 2018-19 –388)
Base: Usage score is based on everybody (Total Sample: 2018-19 – 626)

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Current Usage of Rendering

BREAKDOWN OF CURRENT USAGE

Usage of Rendering by Region

12%
43%
45%

APAC Americas EMEA

Usage of Rendering by Company Size

21%
30%
49%

Large Medium Small

Usage of Rendering by Industry Sector
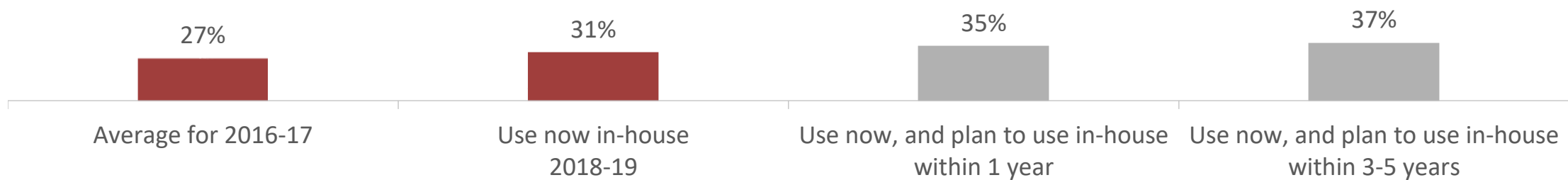

18%
35%
47%

Manufacturing AEC Other

*Based on those using Rendering (n=245)

KEY FACTS

Usage: Rendering usage is lower in APAC.

Most usage is reported within the Manufacturing industry sector and mainly medium size companies.

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Q. Thinking about these trends what do you/your company already use in-house at the moment? (Base: those using Rendering – 245)

39 ▲

CAM

2018-19 IMPORTANCE MEAN SCORE 6.6
CURRENT USAGE 31%

Good current usage, average importance, but small growth potential

27%
Average for 2016-17

31%
Use now in-house 2018-19

35%
Use now, and plan to use in-house within 1 year

37%
Use now, and plan to use in-house within 3-5 years

KEY FACTS

Observation: CAM is a leading trend, it has above average usage and importance, and some future growth is expected.

Sectors: Significantly higher current usage in the Americas, large to medium size companies and in the Manufacturing sector.

Current Use: Among those using/considering to use CAM, 38% reported an increase in the usage of CAM over the last 12 months, 46% said their usage has not changed. Among this audience, MasterCAM (21%), SolidCAM (15%), WorkNC (10%), and NX CAM (9%) are the most used products. 40% of those using/planning to use CAM are planning to add Additive Manufacturing/3D Printing to their use of CAM, 27% have no plans to implement Additive Manufacturing. CAM machine instructions which are automatically generated from 3D CAD models are important for three quarters of CAM users (76%). 57% of users would like their CAD software supplier to put more effort into improving CAD to CAM integration.

Forecast: Potential growth is relatively low, at 19% over the next 3-5 years, this will be driven by the Americas, Manufacturing sector and large companies.

Base: Importance score is based on all aware of this particular CAD Trend in 2018-19 –344
Base: Usage score is based on everybody (Total Sample: 2014 – 409, 2015 – 635, 2016 – 610, 2017 – 720, 2018-19 - 626)

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3D Modelling

2018-19 IMPORTANCE MEAN SCORE 8.6
CURRENT USAGE 69%

Highest current usage & most important trend, but very little room to grow

74%	69%	73%	75%
Average for 2014-17	Use now in-house 2018-19	Use now, and plan to use in-house within 1 year	Use now, and plan to use in-house within 3-5 years

KEY FACTS

Observation: 3D Modelling is a leading trend with the highest importance and usage ratings.

Sectors: High current usage across EMEA, Manufacturing sector, and large companies.
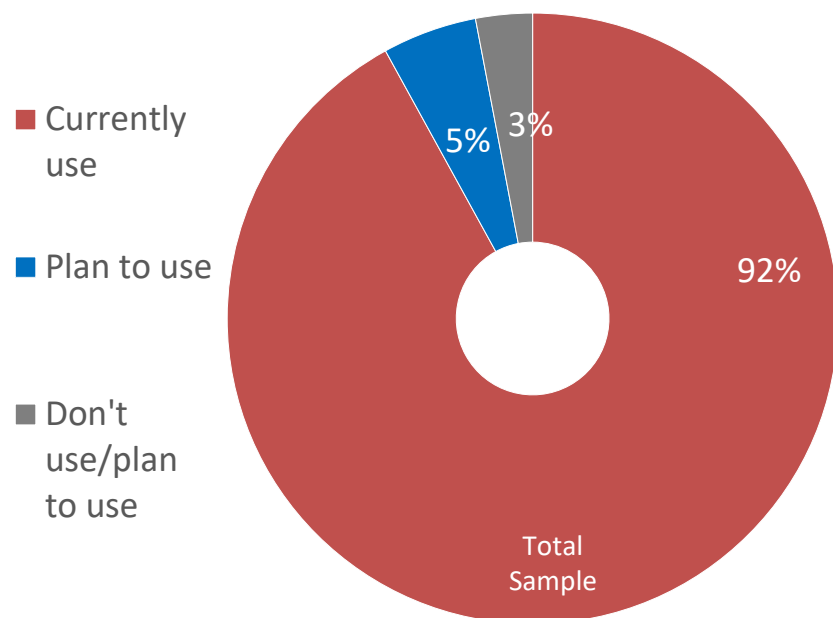
Forecast: Future predicted growth potential is limited (at 9% over the next 3-5 years), due to already very high current usage. EMEA, Manufacturing and large companies will drive this growth in usage.
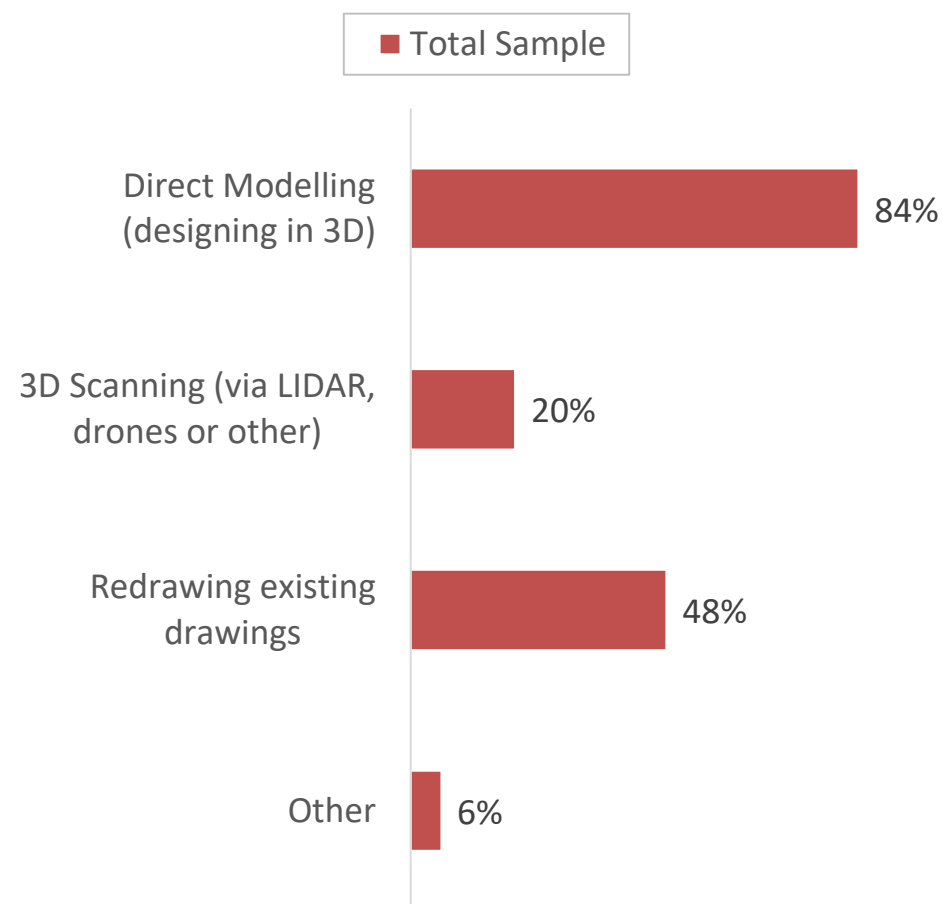
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Base: Importance score is based on all aware of this particular CAD Trend in 2018-19 –506
Base: Usage score is based on everybody (Total Sample: 2014 – 409, 2015 – 635, 2016 – 610, 2017 – 720, 2018-19 - 626)

41

3D Models

Using or planning to use 3D Models

Do you currently use or plan to use 3D Models?

- Currently use
- Plan to use
- Don't use/plan to use

92%
5%
3%
Total Sample

Method of creating 3D Models …

Total Sample

Method	Percentage
Direct Modelling (designing in 3D)	84%
3D Scanning (via LIDAR, drones or other)	20%
Redrawing existing drawings	48%
Other	6%

Q. Do you currently use or plan to use 3D models in your organisation? Q. How do you currently create 3D Models in your company? (Base: Total Sample–626)

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Frequency of Downloading 3D Models

TRENDS 2018-19 AND Y-ON-Y COMPARISON

Legend:
- Average Trends 2014-17 (Total Sample)
- Trends 2018-19 (Total Sample)

	More than 10 times a month	5-9 times a month	1-4 times a month	Once a month	Every 3-6 months	Once a year	Never	Don't know
y-on-y	+6	+5	+1	-2	-4	-3	-5	+3
Average 2014-17	17%	10%	19%	11%	14%	8%	14%	8%
Trends 2018-19	23%	15%	20%	9%	10%	5%	9%	11%
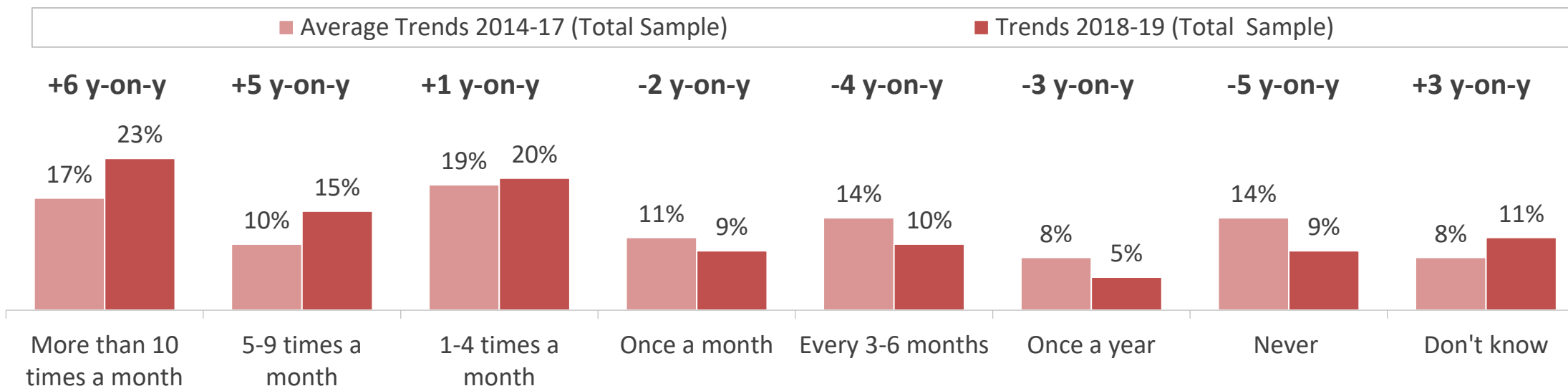
- ■ **Significant increase in the number of users downloading 3D Models regularly (10+ times/month)**
  - ■ Driven by USA users and Utilities, Education and Other industry sectors

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2D Drafting

CAD TRENDS
2018-19

**2018-19 IMPORTANCE MEAN SCORE 8.2
CURRENT USAGE 67%**

Second highest current usage & importance, but almost no future growth potential

70%	67%	68%	68%
Average for 2016-17	Use now in-house 2018-19	Use now, and plan to use in-house within 1 year	Use now, and plan to use in-house within 3-5 years
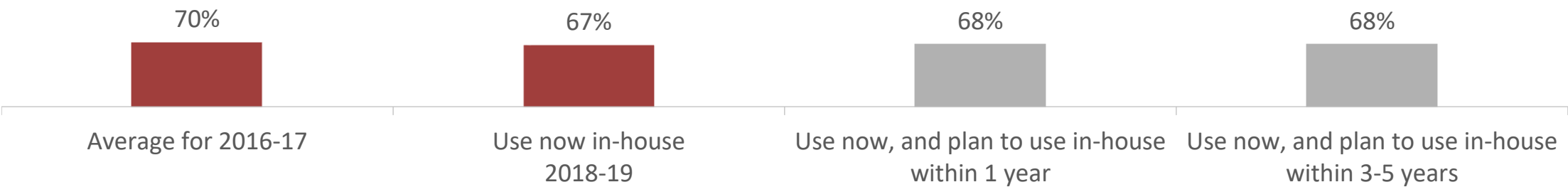
KEY FACTS

Observation: 2D Drafting is a leading trend with one of the highest importance and usage but growth potential is very limited.

Usage: Higher usage in EMEA and the Americas compared to APAC. 53% of the companies who are using/planning to use 2D Drafting have not changed their usage of 2D Drafting in the past year, 22% have increased their usage in the past 12 months.

2D Drawings: Over half of the companies (51%) who are using/planning to use 2D Drafting, create (or plan to create) 2D drawings which are automatically (fully or partially) generated from 3D CAD or BIM models – such 2D drawings are important for 64% of companies. 45% of companies feel that their CAD software supplier should put more effort into improving 2D drafting capabilities.

Forecast: Potential increase in usage is extremely low – only 1% in the next 12 months as well as next 3-5 years.

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Base: Importance score is based on all aware of this particular CAD Trend in 2018-19 –455
Base: Usage score is based on everybody (Total Sample: 2014 – 409, 2015 – 635, 2016 – 610, 2017 – 720, 2018-19 - 626)
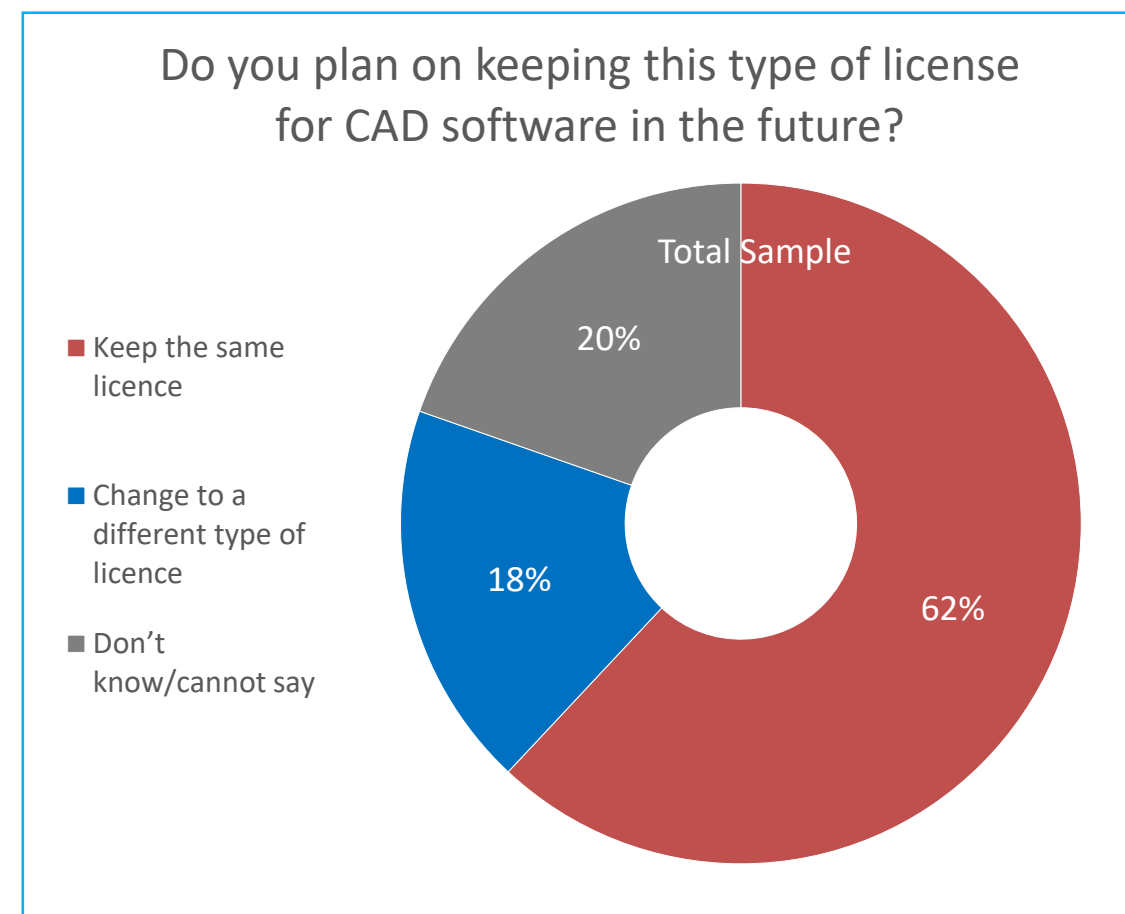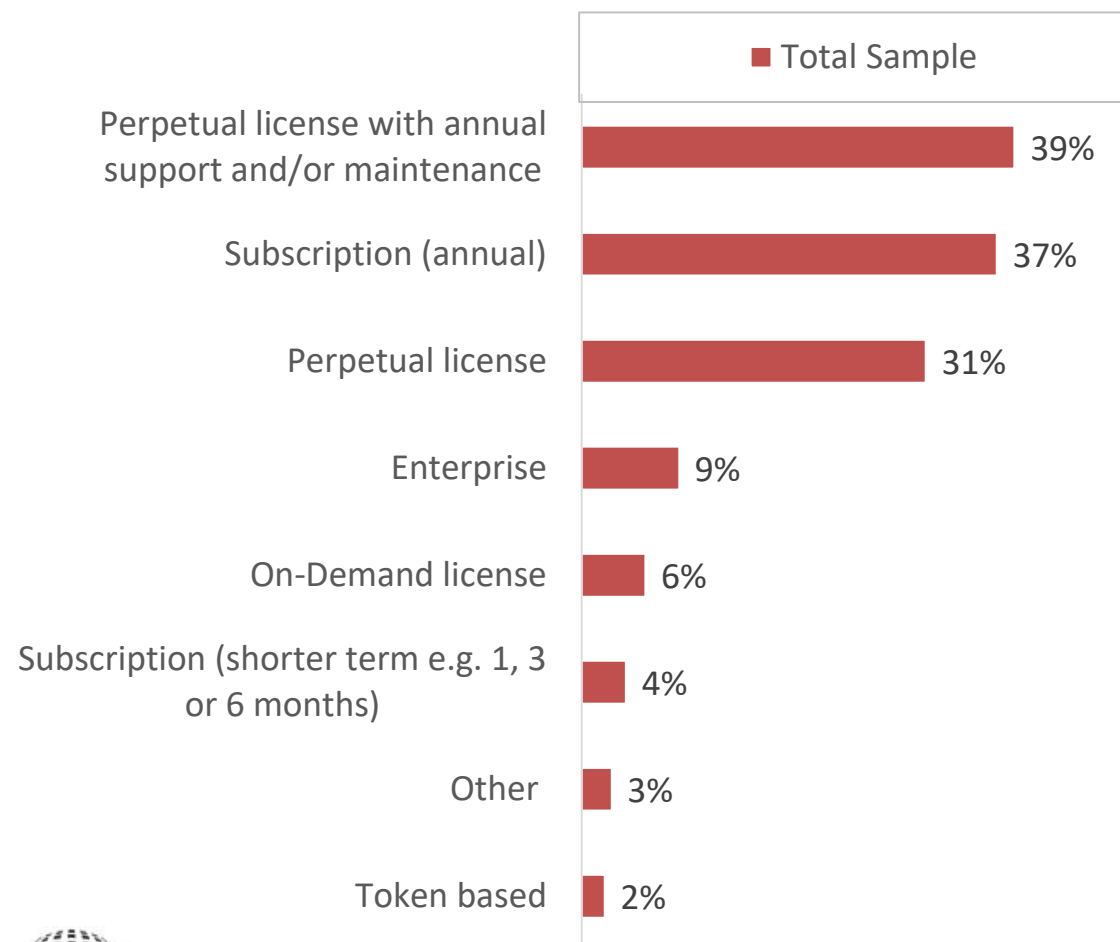
44

CAD Usage
Section Two
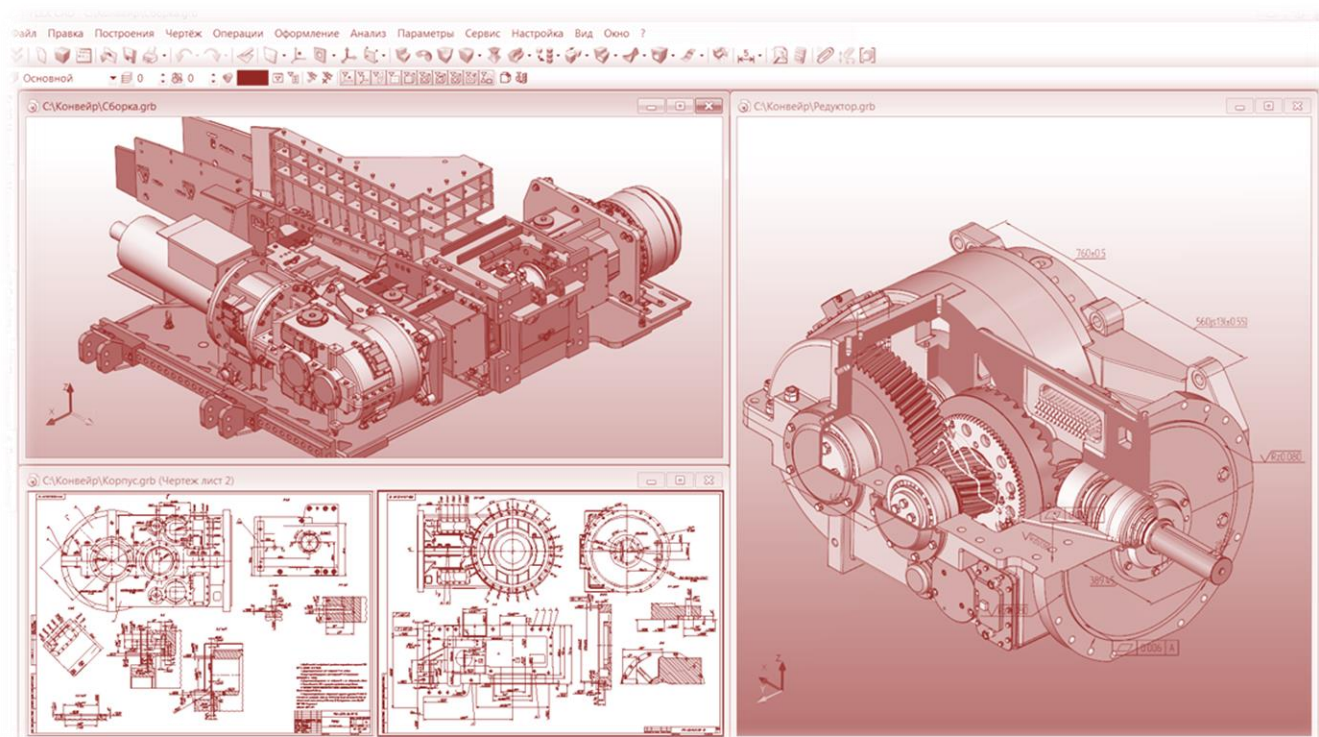
Most used CAD Software Packages

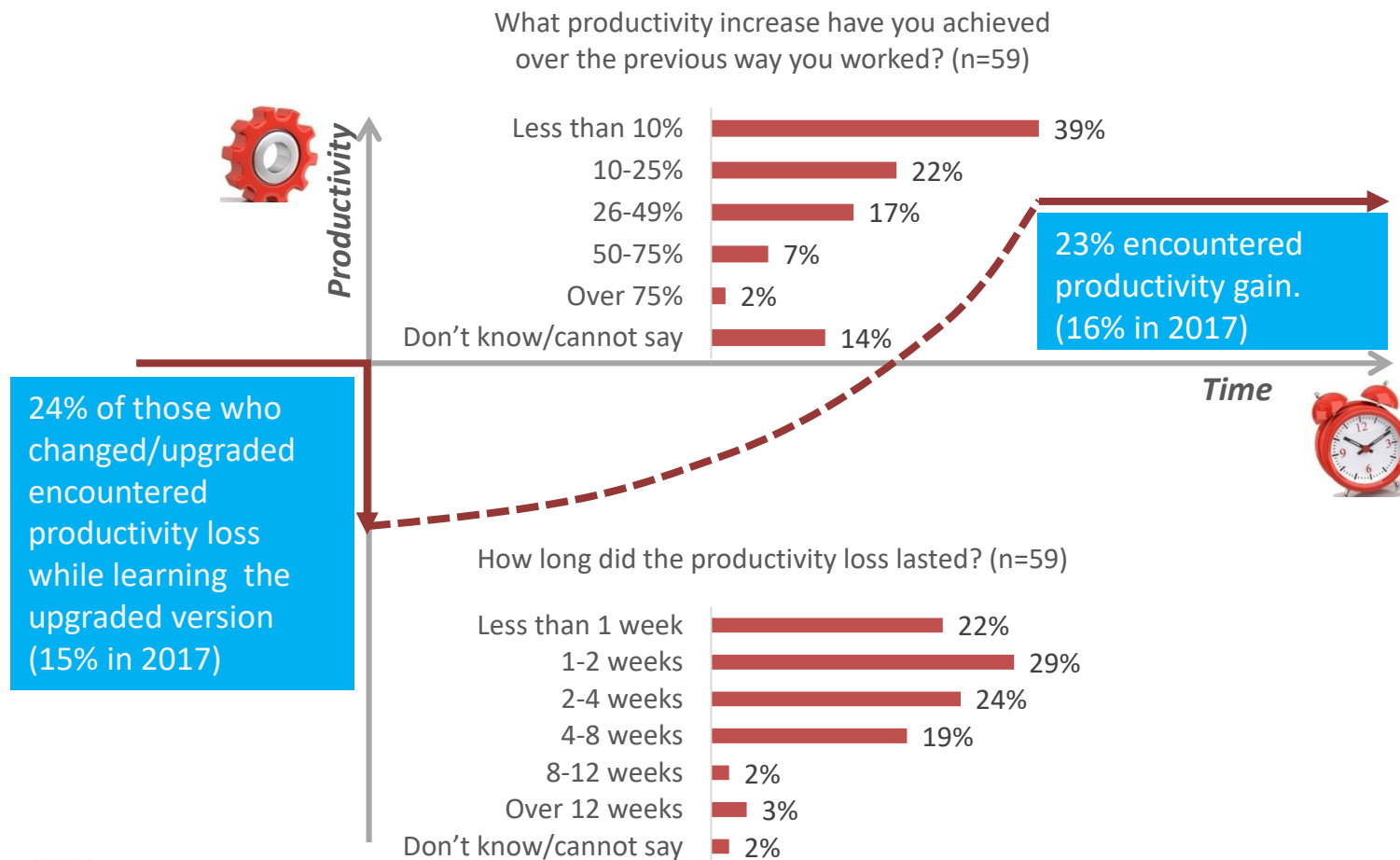| 10 most used packages	Trends 2018-19 (Total Sample)		Segments/Groups driving the usage of these tools….
1	AutoCAD	35%	APAC, AEC and Other industry sectors, Medium/Large companies
2	SolidWorks	25%	Americas, Manufacturing and Other industry sectors
3	Inventor	13%	EMEA, Americas, and Manufacturing sector
4	AutoCAD LT	12%	EMEA, AEC, Small companies
5	PTC Creo	11%	EMEA, Americas, Manufacturing and Large companies
6	Revit	8%	EMEA/Americas, AEC sector, Medium/Large companies
7	CATIA	6%	EMEA, Manufacturing sector, Large companies
8	Civil3D	6%	AEC, Medium companies
9	AutoCAD Architecture	6%	AEC industry sector, Large companies
10	AutoCAD Mechanical	5%	Manufacturing industry sector, Medium companies
	Draftsight	5%	Manufacturing and Other industry sectors, Americas
	NX	5%	Manufacturing, Large companies

Q: What is the primary CAD software you use in your organization? If using more than one please select the 3 most used CAD packages in your organization? (Base: All – 626)

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CAD Software Licensing

Companies are more likely to have a Perpetual license for their Primary CAD software

Total Sample (horizontal bar chart):
- Perpetual license with annual support and/or maintenance — 39%
- Subscription (annual) — 37%
- Perpetual license — 31%
- Enterprise — 9%
- On-Demand license — 6%
- Subscription (shorter term e.g. 1, 3 or 6 months) — 4%
- Other — 3%
- Token based — 2%

Do you plan on keeping this type of license for CAD software in the future?

Total Sample (donut chart):
- Keep the same licence — 62%
- Change to a different type of licence — 18%
- Don't know/cannot say — 20%

Value in Software Upgrades

41% of those surveyed had upgraded, changed or added to their CAD software

What productivity increase have you achieved over the previous way you worked? (n=59)

Productivity

Less than 10%	39%
10-25%	22%
26-49%	17%
50-75%	7%
Over 75%	2%
Don't know/cannot say	14%

23% encountered productivity gain. (16% in 2017)

Time

24% of those who changed/upgraded encountered productivity loss while learning the upgraded version (15% in 2017)

How long did the productivity loss lasted? (n=59)

Less than 1 week	22%
1-2 weeks	29%
2-4 weeks	24%
4-8 weeks	19%
8-12 weeks	2%
Over 12 weeks	3%
Don't know/cannot say	2%

- This year, 41% of the companies changed/upgraded their CAD compared to 51% in 2017. Further, around 9% are planning to change or upgrade their primary CAD in the next 12 months

Q: Did your company change or upgrade the primary CAD software during the last 12 months? Base: Total Sample – 626) Q. Was there a temporary loss of productivity soon after implementing or upgrading your CAD software? Q. What was the loss of productivity soon after implementing or upgrading your CAD software? Base Q. For how long did the loss of productivity last? Q. Once your company learned the new software what productivity increase have you achieved over the previous way you worked? All changing/upgrading 259

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Most used Collaboration Software Tools

Total Sample

Total Sample

10 most used packages	Trends 2018-19 ranking	Trends 2017 ranking (last year)
Y-on-y change		
1 =	1=Autodesk A360	1=Autodesk A360
2 ▲	2=PTC Windchill	1=Autodesk Navisworks
3 ▲	3=SolidWorks Enterprise PDM	3=Autodesk Design Review
4 =	3=Siemens Teamcenter	3=Siemens Teamcenter
5 ▼	5=Autodesk Design Review	3=Autodesk Vault
6 ▼	5=Autodesk Navisworks	6=PTC Windchill
7 ▼	5=Autodesk Vault	7=Bentley ProjectWise
8 ▲	6=Bentley ProjectWise	8=SolidWorks Enterprise PDM
9 =	9=SolidWorks Workgroup PDM	9=SolidWorks Workgroup PDM
10 ▼	10=Autodesk Buzzsaw	9=Autodesk Buzzsaw
▲	10=Aconex	
▲	10=Onshape	

Q: Which (if any) software solution(s) do you/your company use for collaboration, data and information management?
(Base: Total Sample–626)

Usage of Hardware

WHAT HARDWARE IS BEING USED

Legend: Average Usage 2014-17 (Total Sample) / Usage 2018-19 (Total Sample)

Hardware	Average Usage 2014-17	Usage 2018-19
Desktop Workstation	55%	56%
Desktop PC	44%	49%
Laptop PC	32%	34%
SSD (Solid State Drive)	14%	25%
Mobile Workstation	18%	23%
High End Graphics Card(s)	Introduced in 2018	24%
Tablet	5%	9%
Virtual CAD Workstation	7%	7%
Mobile Phone	3%	8%
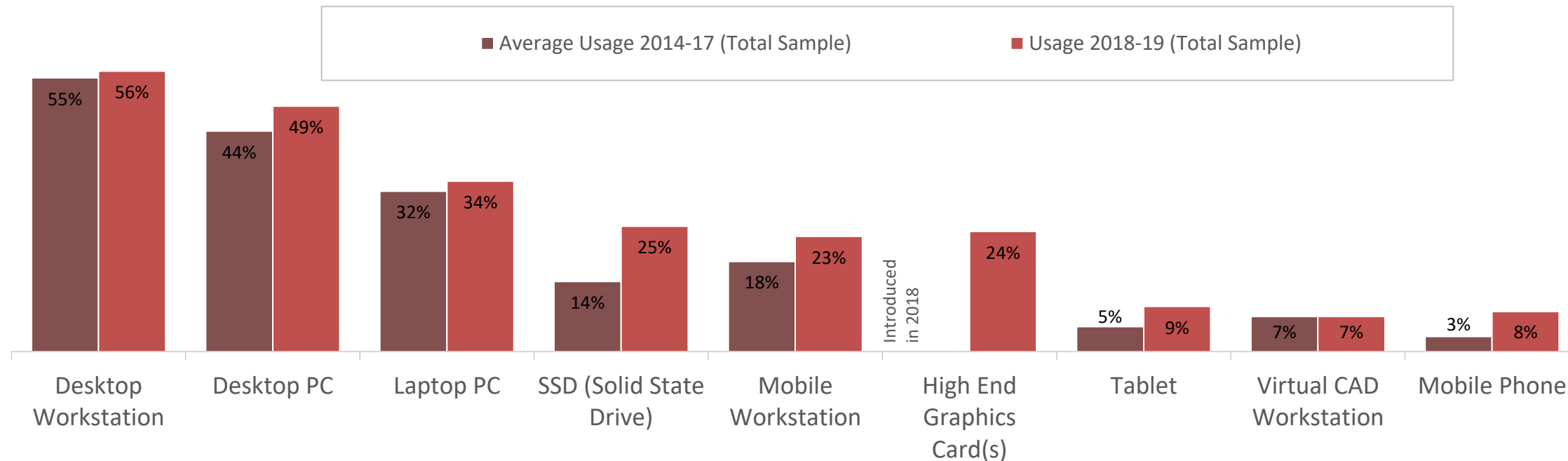
KEY FACTS

Observation: All types of hardware show a year-on-year growth in the usage, Virtual CAD workstations are stable y-on-y.

High end graphics cards have been introduced this year and are used by almost a quarter of those surveyed.

Forecast: Majority of the sample is planning to use the hardware more often in the future.

Usage of High End Graphics Cards

BREAKDOWN OF CURRENT USAGE OF HIGH END GRAPHICS CARDS

Overall Usage of High End Graphics Cards
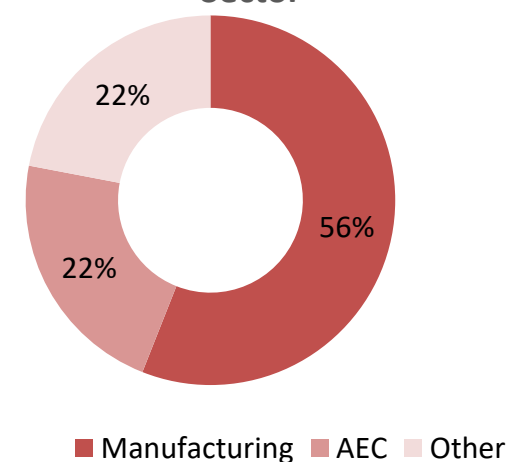
24%

22%
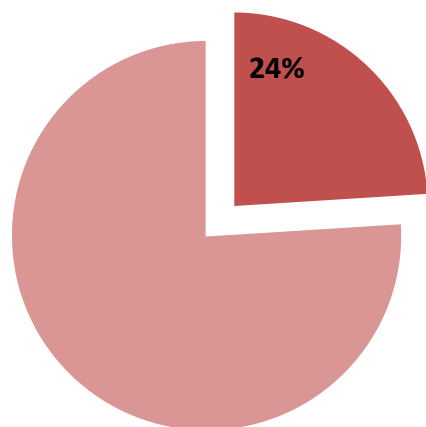
*Based on total sample (n=626)

Usage of High End Graphics Cards by Region

12%

42%

46%

☐ APAC ■ Americas ■ EMEA
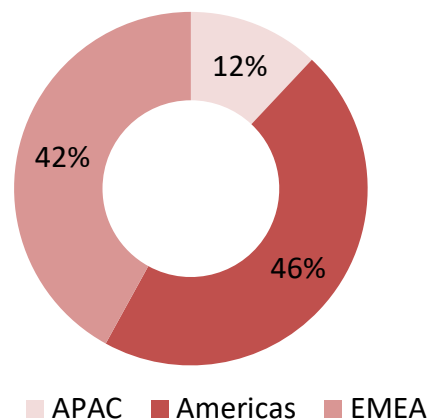
Usage of High End Graphics Cards by Company Size

25%

36%

39%

☐ Large ■ Medium ■ Small
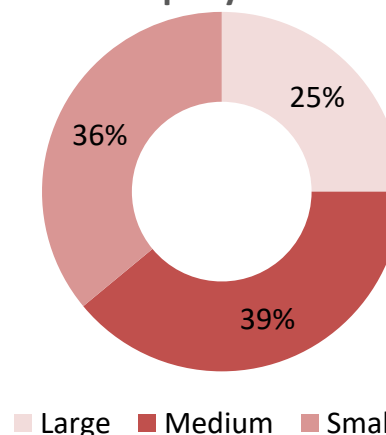
Usage of High End Graphics Cards by Industry Sector

22%

22%

56%

■ Manufacturing ■ AEC ☐ Other

*Based on High-end graphics cards users (n=149)

KEY FACTS

Observations: Currently, 24% of the sample are using High End Graphics Cards.

46% of those using High End Graphics Cards are based in Americas. Over half of the users are from the Manufacturing industry sector.

Forecast: 22% of respondents said they plan to use high-end graphics cards more often in the future - this is true across all regions, company sizes, and industry sectors (but especially Manufacturing).

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Q. What type of hardware do you use for CAD systems at the moment? (Base: All: 2014 – 409, 2015 – 635, 2016 – 610, 2017 – 720, 2018 - 626)
Q. What type(s) of hardware do you think you will use more often for CAD systems in the future? (Base: Total Sample : 2018 – 626)

51

Usage of High End Graphics Cards (cont..)

BREAKDOWN OF CURRENT USAGE OF HIGH END GRAPHICS CARDS

Usage of High-end Graphics Cards by CAD Software Brand
(% of Users of each brand using high-end cards)

Brand	%
Siemens	44%
Dassault	36%
PTC	35%
Bentley	31%
Intergraph	25%
Trimble	20%
Autodesk	20%
All other brands	35%

*Based on total sample (n=626)

Most Used CAD Software by High-end Graphics Cards Users
(Of high-end card users, which CAD being used?)

Software	%
SolidWorks	37%
AutoCAD	28%
PTC Creo	17%
Inventor	15%
CATIA	11%
AutoCAD LT	10%
Siemens NX	9%
Revit	8%
Solid Edge	7%

*Based on High-end graphics cards users (n=149)

KEY FACTS

Usage: 44% of the companies that use Siemens CAD packages have high-end graphics cards.

37% of those having High-end Graphics Cards use SolidWorks, followed by 28% of AutoCAD users.

Q. What type of hardware do you use for CAD systems at the moment? (Base: All-626, High-end graphics cards users (n=149)
Q. What type(s) of hardware do you think you will use more often for CAD systems in the future? (Base High-end graphics cards users (n=149)

CAD TRENDS 2018-19

Popular Sources of Information on the CAD Industry

Total Sample (2018-19)

Source	%
Internet search engines (Google, Bing, etc)	35%
Websites related to software solutions	31%
Webinars	30%
Industry magazines/journals - online/electronic	27%
Emails/post from software providers/ suppliers	27%
On-line blogs/CAD forums/other forums	26%
Industry magazines/journals - print/hardcopy	24%
Free downloads/trials/evaluation version of software	24%
Tradeshows/seminars/roadshows	24%
Reseller/sales representatives	23%
Product demonstrations (face to face/ on-line)	21%
Advice/recommendation from other informal contacts in the industry	21%
White papers	20%
Independent reviews/comparisons of different software	19%
Advice/recommendation from work colleagues	18%
Product brochures (hardcopy/ electronic)	17%
Advice/recommendation from company's IT department	15%
Customer case studies/customer testimonials/customer references/customer…	14%
Net Social Media	13%

Shows significant difference between regions @95% level

KEY FACTS

- Use of search engines and websites as information sources are most mentioned in 2018-19

- Other most mentioned information sources are
  - Webinars, followed by
  - Electronic journals/magazines and direct emails

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Q. Which source(s) of information do you use to keep up to date with regards to the latest developments in the CAD industry? (Base: Total Sample: 2018-19 – 626)

53

Social Media in Focus
As a popular Source of Information on the CAD Industry

Net Social Media — 13%

YouTube — 7%

LinkedIn — 7%

facebook — 7%

Twitter — 3%

Instagram — 2%

■ Total Sample (2018-19)
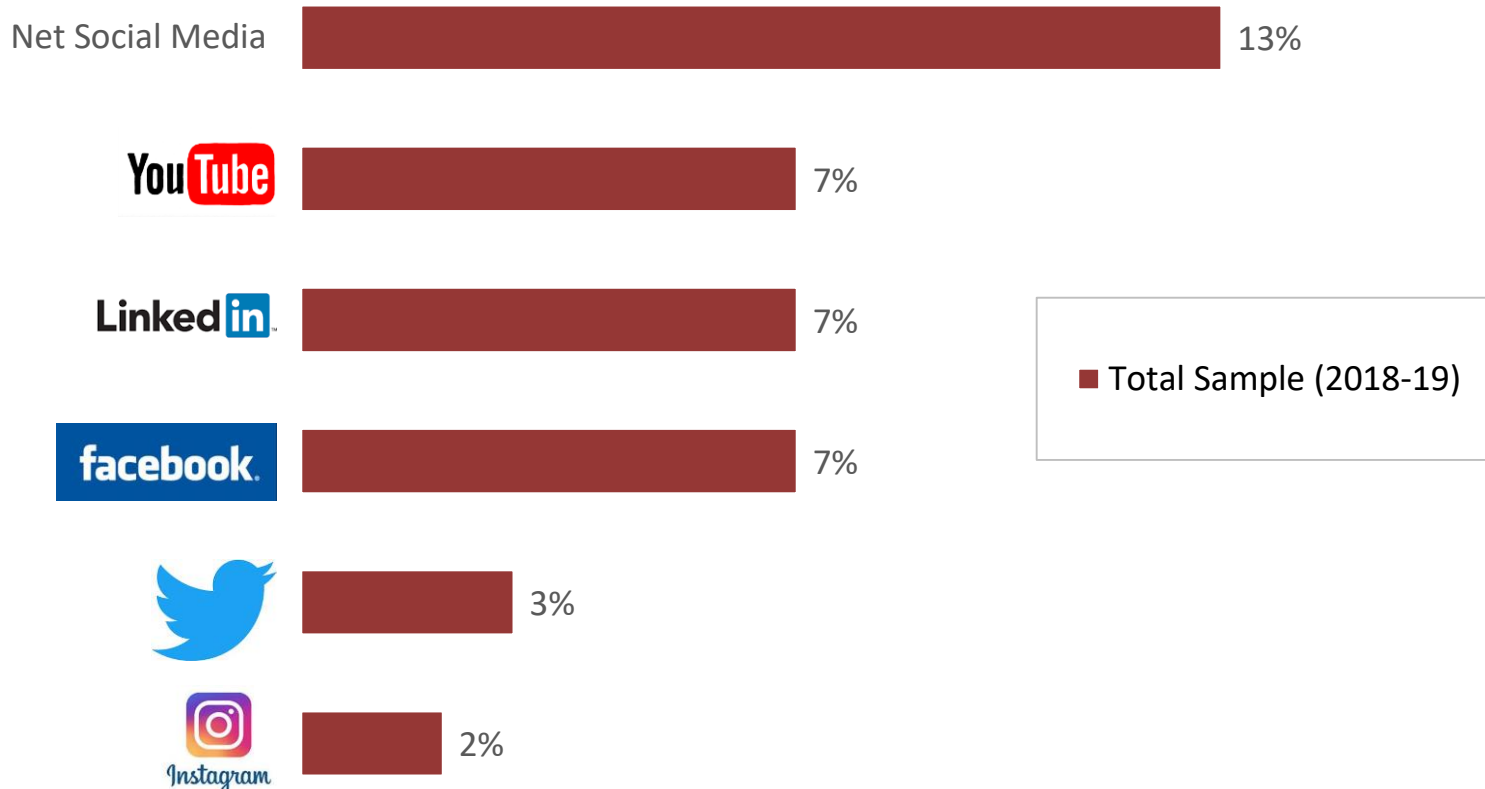
KEY FACTS

- Usage of different social media platforms was broken out in the prompted list shown to respondents

- YouTube, Facebook and LinkedIn are the most used platforms amongst the CAD/CAM audience for all roles

Professional Reports

You may be interested in our Professional Reports with more comprehensive industry insights

CAD Trends Industry Reports for AEC and Manufacturing

CAD Trends in AEC 2018-19

There are also many deeper insights available in this report specific to the AEC sector. This report is based on **223** global participants who are designers, engineers, architects and managers in the AEC sector.

The survey reports...
- ...perceived importance
- ...actual usage of these trends
- ...potential future usage of these trends over time
- Analysis on these 16 trends by geographic regions and size of company
- Year-on-year changes in awareness
- Perceived importance and current usage of these 16 trends specific to the AEC sector

CAD Trends in Manufacturing 2018-19

There are also many deeper insights available in this report specific to the Manufacturing sector. This report is based on **279** global participants who are designers, engineers and managers in the Manufacturing sector.

The survey reports...
- ...perceived importance
- ...actual usage of these trends
- ...potential future usage of these trends over time
- Analysis on these 16 trends by geographic regions and size of company
- Year-on-year changes in awareness
- Perceived importance and current usage of these 16 trends specific to the Manufacturing sector

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Technical Survey Information

Appendix

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Notes on Analysis

YEAR-ON-YEAR SURVEY SAMPLE

- This study has been conducted over five consecutive years. To ensure comparability and so that any changes in the results are true and not a result of different sample profiles, the sampling ensures similar profiles by industry sector and company size as previous year's data. No weightings have been applied

- All bases shown in the report are unweighted – demonstrating the actual sample size, not its weighted equivalent

- 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

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