

# CAD in the CLOUD

## Market Trends 2017



## Preface

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## Executive Summary

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Almost every CAD vendor has plans for the cloud. Not all expect their customers to work solely in the cloud but they all have or are planning a strong cloud component. Probably the most common line of thought is a hybrid approach. However, we will also say that given the path of software development throughout the industry we do believe software in general will one day be delivered in the cloud.

Customers are not so sure. In general, there is still considerable angst about the possibility of essential software moving to the cloud, but we have seen from adjacent fields that customers will adapt more quickly than they think at first.

Based on the results of our CAD in the Cloud survey, coupled with the aggressive moves some vendors are making towards cloud-based provisioning of applications and services, we believe the report reveals a potential for faster acceptance of cloud-based workflows than we previously thought.



CAD/CAM/CAE users are at the early stages of cloud-based workflows. Software vendors are confident of the benefits of leveraging the cloud and are developing products for their customers. However, there is a mismatch in definitions and expectations between customers and vendors, causing an adoption delay but we are seeing customer attitudes change very quickly from entrenched positions to acceptance.

**The report is intended for the following in the CAD/CAM/CAE/PLM and PDM sectors:**

- Product, Development and Marketing Managers of Software and Hardware Vendors and System Integrators
- User organisations – Design, Engineering and CAD Managers and executives
- Research professionals and analysts

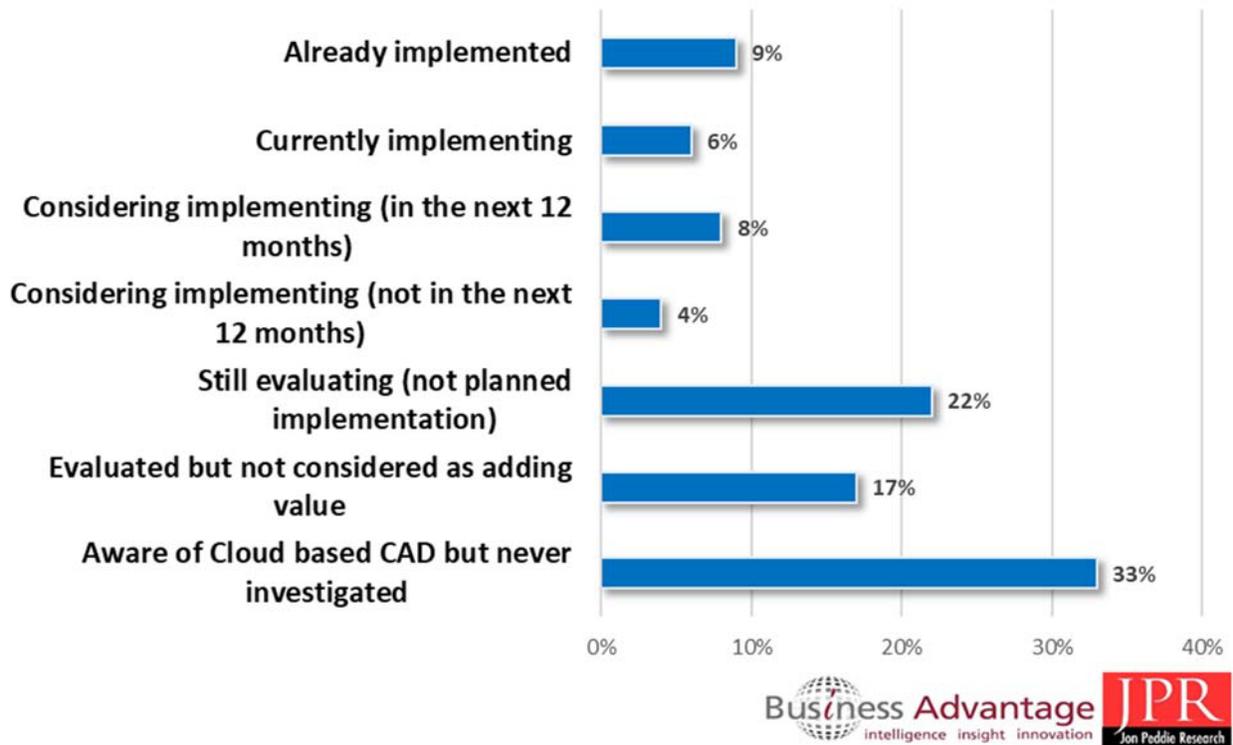
**Read this report to understand the current thinking of:**

- professional engineers, designers, architects and managers
- design/engineering decision makers
- by industry, geography, company size, decision making authority and in some areas software usage.

**For these groups, the report includes insights into areas such as:**

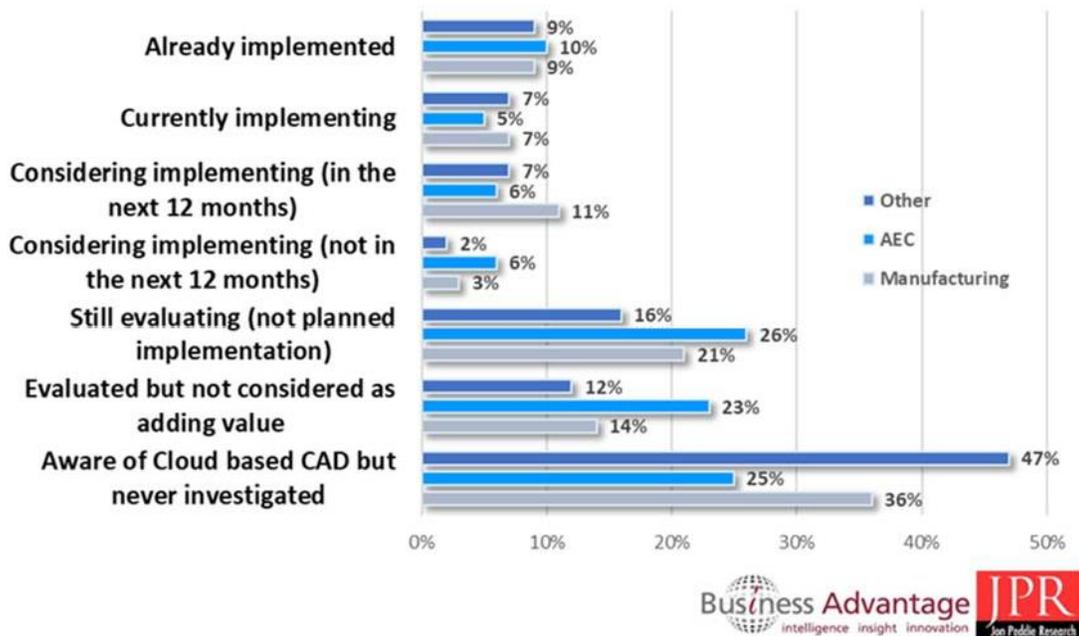
- current and future usage plans for CAD in the Cloud
- which companies, users perceive as the leading CAD in the Cloud vendors
- perceived importance of CAD in the Cloud
- benefit perception vs. reality of CAD in the Cloud
- perceived enablers and inhibitors of CAD in the Cloud
- evolving management and infrastructure approaches to CAD in the Cloud
- hardware considerations for CAD in the Cloud
- and other insights into CAD in the Cloud

For example, in this Figure 1 below, we see current usage and plans for evaluation and implementation in the next 12 months and beyond.



**Figure 1: Usage, evaluation, planned usage and awareness of CiC solutions**

Figure 2 below shows how those implementing and planning to implement CiC, broken down by Manufacturing, AEC and Other sectors, are pretty evenly distributed, with the manufacturing vertical coming out slightly ahead.

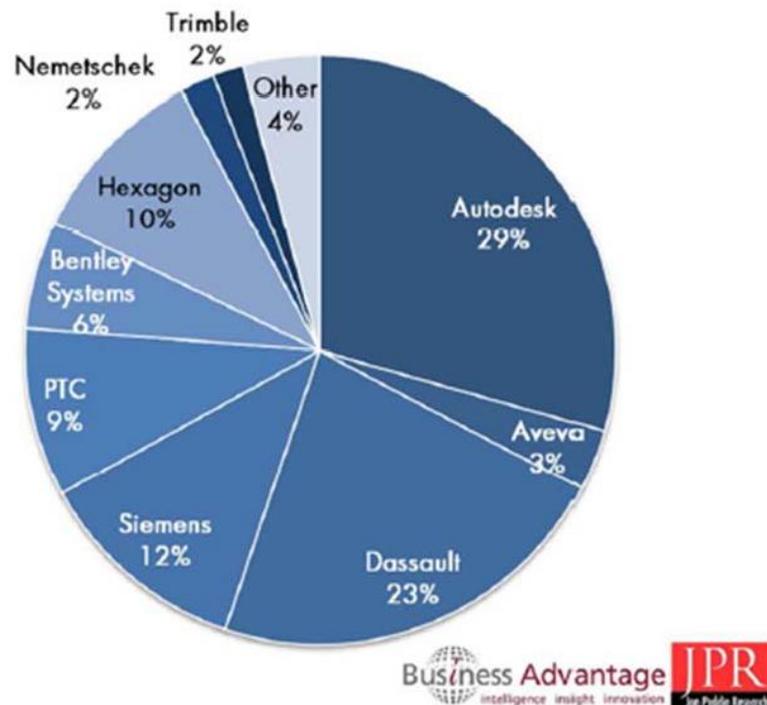


**Figure 2: Planned implementation of cloud solutions for the major sectors**

We believe there is some more work that can be done to change attitudes towards CAD in the Cloud. At many sites, it is a top-down process as company executives opt for the predictability of subscriptions and cloud based provisioning.

Similarly there are differences by geography. Current usage and consideration is similar across regions, but APAC is significantly more likely than EMEA or the Americas to be currently in a phase of implementation. In general, EMEA seems more reluctant to evaluate CiC than North America or APAC. EMEA companies (44%) for example are most likely to have basic awareness of CiC with no further investigation or consideration having taken place compared to Americas 27% and APAC 24%.

Many vendors have not spelled out their commitment to cloud based work-flows even though they may have more quietly let it be known to long term customers, major accounts, and to analysts. We also looked at attitudes of Autodesk users compared to non-Autodesk users and we have found Autodesk users to be more open to the cloud. Autodesk communicated with its customers about the advantages of CAD in the cloud. It has rolled out various cloud-based benefits to its customers on maintenance and now subscription plans.



**Figure 3: CAD company market shares (by revenue)**

JPR puts the revenue for CAD software at \$8 billion for 2016. The CAD market has a majority of 2D users; we see that changing but gradually.

For the long term, there will always be a strong base of 2D because the format holds legacy data and is still the file of record in many industries. What's interesting and what will continue is that 3D CAD accounts for the majority of revenue in the CAD industry even though 2D CAD has more users. What is evolving is that 3D is for design, models of record for construction and production and 2D is primarily a documentation and archival tool. We see that trend increasing to the point that it becomes almost irrelevant to talk about the two disciplines as one. They are related, of course, but 2D becomes as relevant to the creation process as PDF is to the production of a legal document.

## Introduction

---

Jon Peddie Research (JPR) and Business Advantage (BA) have co-created this special report on CAD in the Cloud using a custom designed survey together with other insights and additional industry data.

We are at the early stages of cloud-based workflows especially for professional applications. The early models for cloud work including SaaS (Software as a Service) and browser based access may not be applicable to the professional workflows required for CAD. Indeed, the responses to the survey and additional research clearly reveal a population with mixed emotions about the cloud and the ways in which it might benefit their work.

However, software vendors are confident of the benefits of leveraging the cloud and are developing products for their customers.

There is a mismatch of definitions and expectations between customers and vendors, which we see as causing an inevitable delay to the adoption of useful applications. At the same time, we have seen customer attitudes change very quickly from entrenched positions to acceptance.

Some of the challenges lie in definitions and key questions:

- What is meant by CAD in the Cloud?
- Who controls the application?
- Where is my data?

In this report, we will:

- examine the responses of customers to early implementations, and planned implementations, of cloud workflows
- describe the answered and unanswered questions as we see them in the use of cloud resources
- discuss the development activities of CAD vendors as they relate to the cloud, and
- describe the path of acceptance as we see it to different cloud workflows

Obviously, we live in a fast-evolving universe. The concept of cloud-based tools is new and as we will see in this report, evolving as people put them to real use, become more comfortable with the idea and understand the benefits. We will try, with the benefit of this early survey into customer attitudes and our consultations with vendors and our own observations and experience to understand the potential for this market and the different approaches we see evolving.

## Who are the producers of this report?

---

Jon Peddie Research (JPR) is a technically oriented computer graphics marketing and management-consulting firm based in Tiburon, CA. We provide specialized services to senior and middle management in computer companies and companies that are major computer users.

JPR helps clients with special projects, which include strategic analysis, planning, special reports, due diligence, new product evaluations, etc. We provide clients with reports and consulting on Market and Competitive Analysis, Trend and Market Forecasting, Market Strategy and Planning, Product Definition and Planning, Specialized Show Coverage and Reports, as well as Articles and Lectures.

JPR publishes a bi-weekly report on market and technical developments pertaining to the capture, generation, or use of pixels—we follow the pixel. We also publish quarterly reports on graphics processing units (GPUs), add-in boards (AIBs), and visual processing units (VPUs), as well as semiannual reports on workstation, gaming PCs, TV gaming, and annual reports on CAD, Media & Entertainment (M&E), and rendering and ray-tracing (RT).

Business Advantage: Formed in 1992, Business Advantage is an international B2B market research, business development, data services and marketing consulting practice operating in the global IT, Digital Communication and Telecommunications sectors and with a special focus on CAD, computer-aided manufacturing (CAM), computer-aided engineering (CAE), PLM, Product Data Management (PDM), virtual reality (VR), augmented reality (AR), 3D Printing and related spaces where we have completed more than 650 projects in 100 countries.

Business Advantage provides a wide range of services including market research, competitor analysis, database services, and consultancy to many leading international companies, including 3M, Autodesk, Canon, Dell, Facebook, HP, Infor, IBM, Intel, Lexmark, Microsoft, Oracle, Salesforce, SAP, SolidWorks, Sony, Sophos, Xerox and many others.

## Study Goals and Definition

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This report looks at the survey results in the context of the broader uses of cloud workflows. By using the most restrictive definition of CAD in the Cloud we have a baseline of customer interest and acceptance in these early days of cloud-based workflows.

CAD in the Cloud (CiC) is an easy label and accurate in its way, but it is also a broad description and thus almost meaningless in helping customers understand what benefits they might see as a result of new cloud technology.

For the purposes of this survey we defined CAD in the Cloud as a model where software applications are delivered to the user over the internet i.e. software is not stored on the company's network, desktop PC, laptop etc. Often CAD users will also save their files externally i.e. on the Cloud. We did this to eliminate ambiguity in the minds of respondents.

## Scope of Report

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We are in the early days of a technology inflection point. The survey has indicated that CAD professionals are moving towards adopting new methods of working that include adopting cloud-based applications.

This report is a combination of market data on the CAD market, hardware market data and discussions and the results of a CAD in the Cloud survey and webinar. To understand the survey participants, it is useful to know that nearly 1,000 CAD users and decision makers around the world began the survey; however, only people who were using a CAD system in house AND who were actively using OR were aware of CAD in the Cloud were allowed to participate. As a result, 203 people qualified to participate in and completed the full survey. With 203 completions, statistically reliable results can be provided for responses on a global basis and also for responses by large sample groups such as Architecture, Engineering & Construction (AEC) vs. Manufacturing, or attitudes in the Americas and Europe, the Middle East and Africa (EMEA) or sorted by company size for example, while we can provide indicative results for smaller sample size groups such as Asia Pacific (APAC) responses and responses by larger companies. Any area or grouping where the total sample size is less than 50 should only be viewed as an indication of a result or trend rather than a statistically reliable outcome.

## Intended Audience

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This study covers the market opportunities involved in CAD in the Cloud (CiC) systems, recent advances in the technologies involved, various traditional and new applications and global markets for these technologies and applications. The report will be useful for:

- Manufacturers of CAD (and related) systems and components
- CAD/CAM/CAE software developers
- Systems integrators
- Design and application engineers
- Various industries and agencies needing or considering CAD in the Cloud systems
- Manufacturing planners
- Security system planners

Investors, analysts, and senior management will also find useful information in this report.

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