

A Forrester Consulting
Thought Leadership Spotlight
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Real-Time Rendering Solutions: Unlocking The Power Of Now



Project Director:
Tarun Avasthy ,
Market Impact Consultant

Contributing Research:
Forrester's Infrastructure &
Operations research group

FORRESTER



81% of firms are likely to adopt real-time rendering engines.



Introduction

Technology has enabled brands to have more exposure, creativity, and impact in the way ideas are portrayed and conceptualized. The manufacturing, architecture, and media and entertainment industries are now adopting real-time rendering solutions, traditionally used for gaming. But why? Real-time rendering solutions enable employees to make faster iterations and changes to designs compared to traditional offline rendering methods.

In February 2018, Epic Games commissioned Forrester Consulting to evaluate industry perceptions and insight of real-time engine technology across media and entertainment, manufacturing, and architecture spaces. Forrester conducted an online survey with 168 respondents in the US and the UK with decision-making responsibility for or knowledge about real-time engine technology within their organizations.

KEY FINDINGS

- › **Adoption of real-time rendering solutions is expected to increase.** Eighty-one percent of firms are likely to adopt real-time rendering engines over the next 12 months, and 59% are planning to adopt real-time rendering engines into production within the year.
- › **Real-time rendering engines boost employee productivity.** Ninety percent of firms surveyed said that driving productivity through real-time rendering will improve their bottom line.
- › **Iterations and revision processes are sped up.** Eighty-two percent of firms said real-time rendering engines speed up processes. Similarly, 82% said it drives a faster iteration and revision process.
- › **Employees save almost a quarter of time compared to traditional processes.** Eighty-three percent of firms are saving at least 25% of time compared to previous processes.
- › **Developing and reusing assets saves time and ensures consistency.** Sixty-seven percent said real-time engines create reusable assets and brand consistency.

Real-Time Rendering Solutions Underpin Flexibility

The pace of change continues to accelerate. The last 10 years have seen significant innovation in interactive graphics software — specifically in the gaming industry. Video games are a visual medium, and their graphics have come a long way: Pixelated figures have evolved into more life-like designs. The ongoing demands to increase productivity and cut costs have further accelerated these advancements. In organizations with design, engineering, video editing, and other creators, these computing advances ensure faster design processes and concept iterations.

Real-time rendering solutions have emerged as the solution to overcome the complexity, sophistication, and demand of enterprise workloads. In fact, 81% of survey respondents said they're very likely or likely to adopt real-time rendering engines into production over the next 12 months (see Figure 1).

But what is real-time rendering?

Real-time rendering allows users to manipulate cinematic, 3D, augmented reality, or virtual reality imagery quickly so that a user can interact, move, or manipulate it in relation to a set environment.

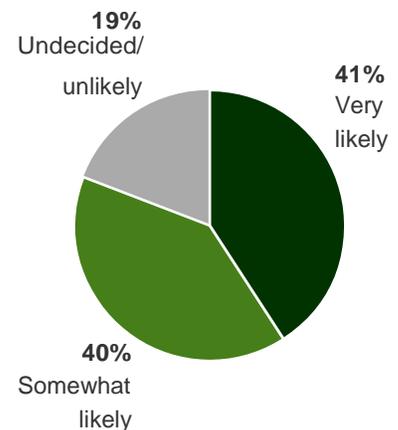
Today's designers and visualization specialists are moving away from slower, iterative, traditional offline methods of rendering in favor of adopting real-time workflows. This sentiment is reflected by our survey respondents. When we asked about the key drivers in adopting real-time rendering solutions, the responses pointed to generic and industry-specific drivers (see Figure 2):

- › **Visualizing, overcoming complexity, and reducing time were top needs.** Seventy percent of survey respondents identified the need to visualize results from big data and artificial intelligence (AI) applications. Also, the growth and complexity of computing workloads mean more computing power is needed to get their jobs done (69%). And, due to the hypercompetitive market, the need to reduce the time taken to create high-fidelity rendering images/animations is greater than ever before (65%). Ultimately, these solutions help workers save time, enable them to experiment more often, and allow them to make changes to their work when and where it suits them.
- **Manufacturing.** Fast-paced and rapid iterations ensure that manufacturers can assemble machinery from disparate visualization parts (70%). They can also share complex designs (64%) allowing for faster, more effective decision making that can significantly speed up the design and review process.
- **Media and entertainment.** Using real-time rendering solutions is a natural step for the media and entertainment industry. Being able to previsualize shots more effectively (65%) or integrating special effects (58%) in real-time not only enables the creative juices of designers and editors but also encourages creative experimentation.

81% of survey respondents said they're very likely or likely to adopt real-time rendering engines into production.

Figure 1

“How likely are you to adopt real-time rendering engines into production?”



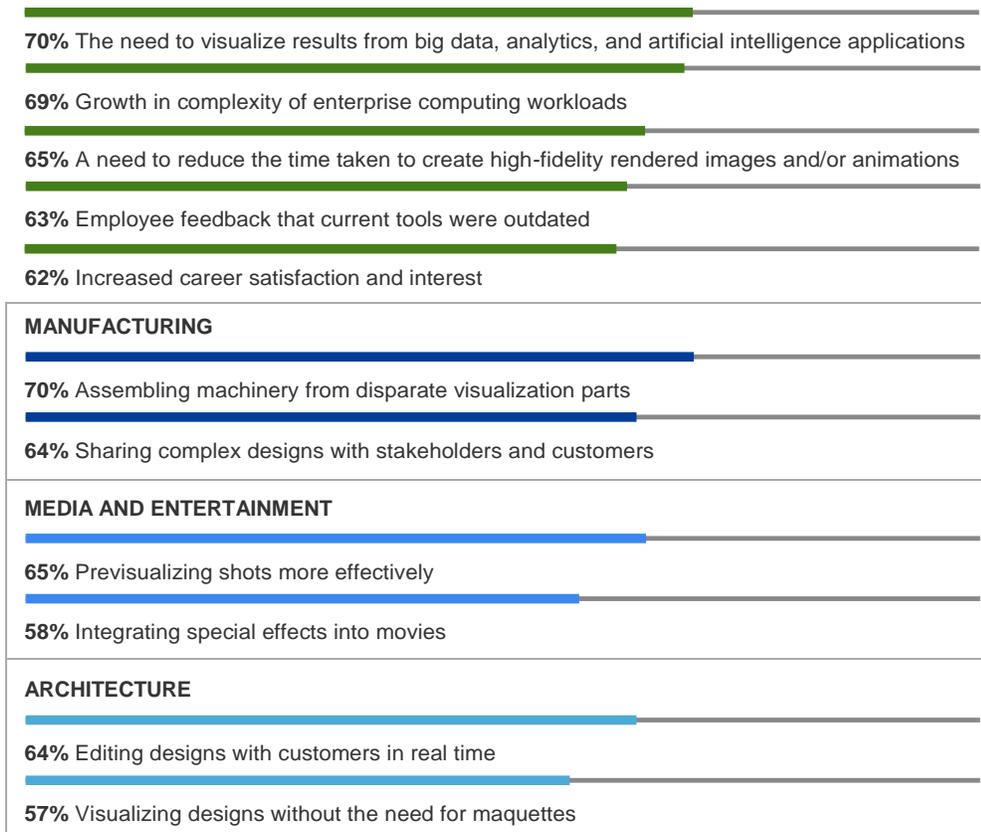
Base: 168 real-time engine technology real-time engine technology influencers, users, and decision makers
Source: A commissioned study conducted by Forrester Consulting on behalf of Epic Games, July 2018

Manufacturers said that the ability to reduce the need for physical prototypes or mockups is a key driver for adopting real-time technology.

81% of media respondents said offline rendering solutions are a barrier to exploring creative choices.

Figure 2

“Which of the following business imperatives would drive your organization to adopt real-time rendering solutions?”
(Showing “Very strong” and “Strong” driver combined)



Base: 168 real-time engine technology influencers, users, and decision makers
Source: A commissioned study conducted by Forrester Consulting on behalf of Epic Games, July 2018

- **Architecture.** Previewing a design to a customer is one thing, but responding to live feedback and having the ability to adapt in the moment and create interactive, customizable experiences is an incredibly powerful concept. Sixty-four percent of architects agree with this notion.
- › **Outdated tools hinder creativity.** Employees are increasingly becoming more expressive and crave more career satisfaction and interest (62%). Real-time rendering solutions enable employees to drive better creative processes. In other words, the more interactive the creative processes are, the more “what-if” scenarios can be explored.
- › **In the age of the customer, direct experience increasingly matters.** Customers and stakeholders value an interactive experience of a design, where they can easily explore different views and make simple changes; 82% of respondents agree that this is the case. Another 71% agree that customers and stakeholders expect to be shown highly realistic imagery. Whether it’s an architect working on a design in real time with a client or a manufacturing salesperson visualizing machinery, the direct experience of immersive visualizations is becoming key to business success.

83% of architecture respondents said they’re able to reduce the need for physical prototypes or mockups — a key driver to adopting real-time technology.

Perception Versus Reality: What Hinders Adoption?

As real-time rendering solutions undergo a transformational shift and the need for more interactive experiences emerges, the competitive landscape is changing.

However, not all organizations have jumped on the real-time rendering technology bandwagon yet. When asked about the challenges in adopting real-time rendering technologies, survey respondents indicated several perceived barriers that hold some organizations back:

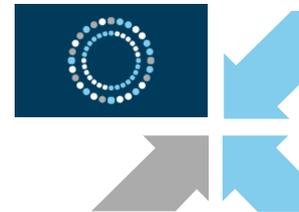
- › **Unsupported beliefs around cost drives organizations away.** Forty-two percent of survey respondents identified software costs as the main challenge inhibiting real-time rendering engine adoption. However, the actual barrier for entry is much lower with some real-time rendering firms offering “lite” versions or a monthly subscription that can overcome this challenge. Additionally, 27% perceive the cost of implementation as being high, and a further 27% lack a clear understanding of the ROI.
- › **Lack of skills and expertise hinder real-time rendering adoption.** Organizations wishing to employ the latest real-time rendering tools must either train or hire talent conversant with the technology, with 3D rendering in general, and with using the outputs to drive business results. It's no surprise, then, that another inhibitor is the lack of knowledgeable staff (30%) in using the technology. In fact, 27% identified the inexperience of staff using such tools. The steep learning curve of the solution represents the lack of skills and expertise firms currently have. Successful organizations are largely driven by the right people, the right organizational structure, and a wide range of training resources to support organizations in launching or expanding the solution.
- › **Educating the organization on what they can and cannot do.** Real-time rendering is intertwined with the digital age, and although real-time engines have been used for gaming (22%), the use cases are much more widespread. Organizations must discover what is possible with real-time rendering tools. In fact, 59% of survey respondents are likely to adopt real-time rendering solutions into production in the next year to overcome traditional means of creating, designing, and visualizing.



The Opportunity And Benefits Of Real-Time Rendering

Fortunately, organizations recognize the performance improvements they get from using real-time rendering solutions. Designing, rendering, animating, and editing visualizations all benefit from real-time rendering solutions. Our survey found (see Figure 3):

- › **Real-time rendering solutions are all about increasing productivity.** Eight out of 10 firms strongly agree or agree that driving productivity through real-time rendering will improve their bottom line. Faster iteration speeds, greater design flexibility, and better visualization can impress clients, accelerate time-to-market, and create more opportunity for employees to be satisfied with their work. In fact, 76% said the time it takes to render offline solutions is a barrier to exploring creative choices. With real-time rendering, employees can create a graphical asset once and reuse it anywhere, anytime — enabling employees to focus time on creative elements, quality, and other outcomes (81%, see Figure 4).
- › **Visualizing design elements is important.** Survey respondents agree that not only does real-time rendering increase productivity, it also improves the visualization elements, thus reducing design errors before structures are built (84%) and being critical to designing new structures (78%). If changes were made using offline rendering techniques, that would result in spending minutes, hours, and even days for redesigning/rendering a new iteration to accommodate changes. Leveraging real-time techniques enables designers and artists to make tweaks and adjust their designs in real time.
- › **Benefits of real-time rendering technology is vast.** Shifting to real-time engines unlocks the possibility of experiencing a product or design long before it's ever executed, speeding up processes (82%). Also, the flexibility of these processes enables employees to drive faster iterations (82%). In fact, when we asked our survey respondents how much time they were saving compared to previous processes with real-time rendering technology, 83% said they're saving at least 25% of their time.

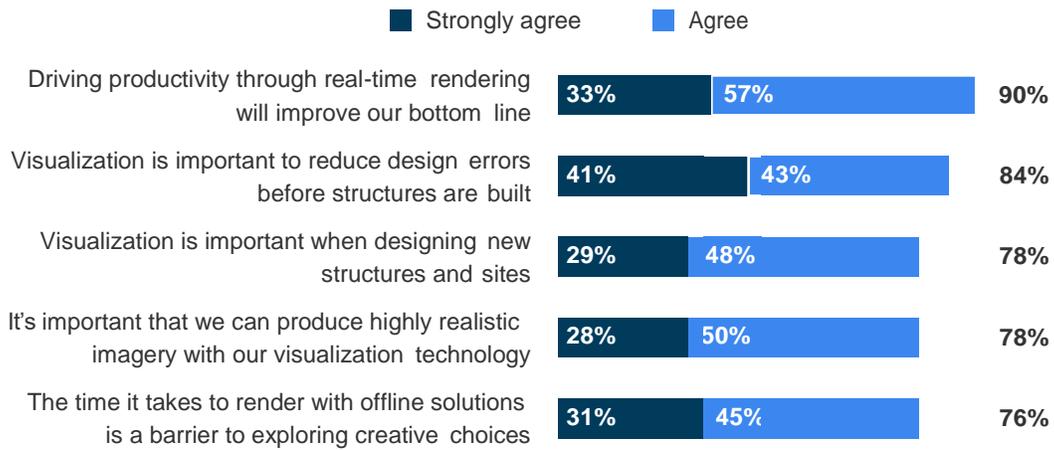


Eight out of 10 firms strongly agree or agree that driving productivity through real-time rendering technology will improve their bottom line.



Figure 3

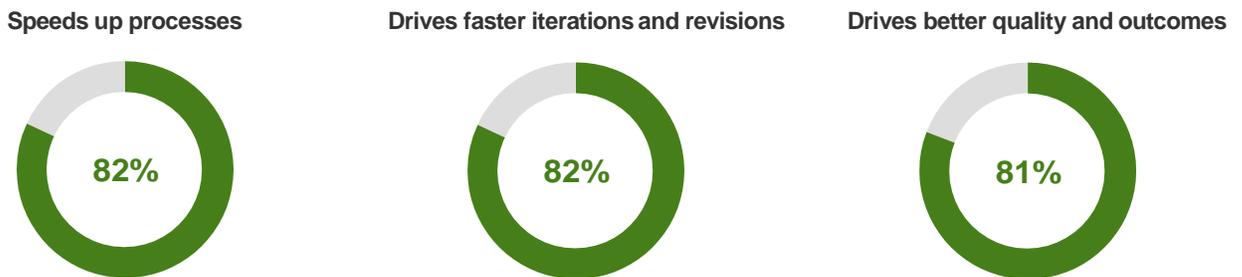
“How much do you agree or disagree with the following statements?” (Showing “Strongly agree” and “Agree” only)



Base: 168 real-time engine technology influencers, users, and decision makers
Source: A commissioned study conducted by Forrester Consulting on behalf of Epic Games, July 2018

Figure 4

“How much do you agree with the following statements?” (Real-time rendering technology . . .)



Base: 168 real-time engine technology influencers, users, and decision makers
Source: A commissioned study conducted by Forrester Consulting on behalf of Epic Games, July 2018



Key Recommendations

Customers and employees both expect more from companies today: Increasingly, immersive digital experiences are vital to helping visualize, understand, sell, and service products and experiences. In the media and entertainment, manufacturing, and architecture verticals, real-time rendering technology will drive higher quality, faster time-to-completion, greater creativity, and, ultimately, more satisfied customers and employees across a wide array of products and business processes.

Forrester's in-depth survey of 168 respondents in the US and the UK with key decision-making responsibility for or knowledge about real-time engine technology within their organizations yielded several important recommendations:



Evaluate customer and employee journeys. To maximize the value of real-time rendering engines, undertake two evaluative processes. First, study the customer journey of your prospects and customers to identify what will benefit them from immersive digital experiences. Whether it's an architectural buyer gaining real-time insight into design changes or manufacturing customers realigning an order, establish the customer value. Second, study the employee journey. Whether it's giving cinematographers the ability to previsualize a shot or engineers collaborating on a design, immersive digital experiences can turbo-charge employee effectiveness.



Audit current skills and roles. Maximizing the value of real-time rendering technologies requires having the right mix of skills and jobs in your organization. Ensure that you have training programs in place to onboard current employees to the real-time rendering benefits. And hire net-new employees, when needed, to make certain you have the right mix of developers, 3D visualization experts, and other roles in-house.



Follow your peers on features. Prospective real-time rendering engine buyers seek numerous features: Ease of use, quality of renderings, price, developer tools and training, and industry-specific features are all high priorities when choosing a solution. Expect all of these and more, using trials and testing to prove out capabilities in your own environment.



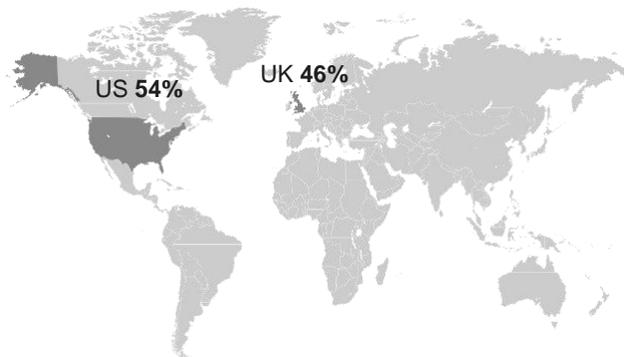
Measure results and expand deployment. Once you have successfully deployed real-time rendering for a scenario, measure results carefully. Have you achieved faster time-to-market with products? Have production cycles shrunk? Are you driving higher customer and employee satisfaction? Next, investigate other use cases that might benefit from expanding deployment of real-time rendering. Moving from employee-only to customer-facing experiences, collaborating across geographies, or repurposing content assets can help you drive even more value from real-time rendering technology.

Appendix A: Methodology

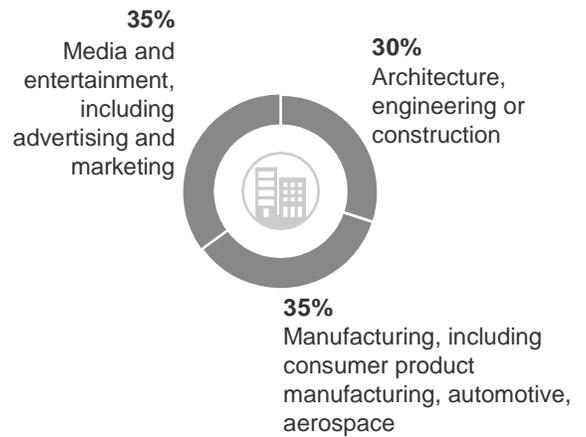
In this study, Forrester conducted an online survey of 168 respondents in media and entertainment, manufacturing, and architecture firms in the UK and the US to evaluate industry perceptions on real-time rendering engines. Survey participants included decision makers or those who had knowledge of use cases of real-time engine technology within their industries and organizations. Questions provided to the participants asked about key business imperatives driving their organization to adopt real-time rendering solutions, the likelihood of adopting rendering engines into production, and the importance of rendering solutions in the future. We also explored some of the barriers faced by organizations in adopting real-time rendering solutions. The study began in February 2018 and was completed in July 2018.

Appendix B: Demographics/Data

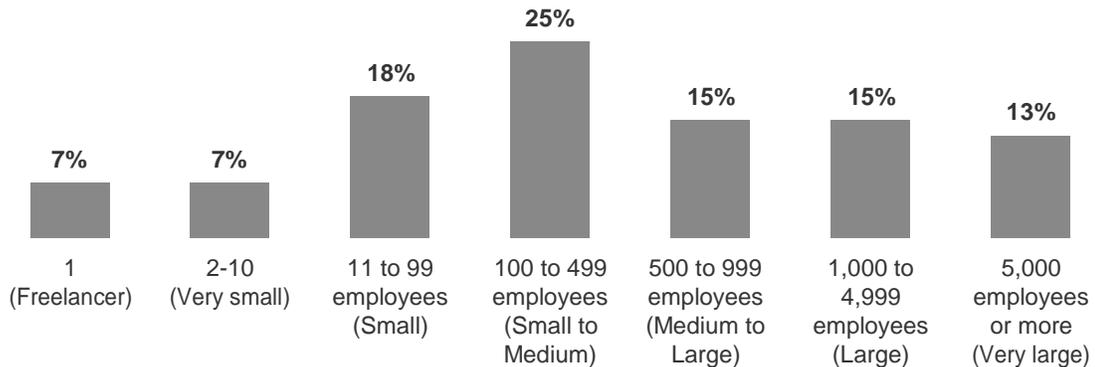
“Which country are you located in?”



“Which of the following best describes the industry to which your company belongs?”



“Using your best estimate, how many employees work for your firm/organization worldwide?”



Base: 168 real-time engine technology real-time engine technology decision makers
 Note: Percentages may not total 100 because of rounding.
 Source: A commissioned study conducted by Forrester Consulting on behalf of Epic Games, May 2018