

Pipeline Survey Results

(Abridged)

March, 2019

Introduction

This is the first annual pipeline survey. The purpose of this survey is to measure the state of pipeline related technologies in the media and entertainment industry. Studios have been developing technology to optimize and automate artist workflows from the very beginnings of this industry. Since then, the tools and data we use has become more complex, even as the projects we work on grow in scope and size.

The development of software such as asset management systems and execution engines for process graphs has enabled more artists to achieve ever more amazing creative results and have provided automation for ever more complex workflows.

Given the importance of these technologies, we thought it was important to understand their place in our industry, how solved the related problems are, and how valuable we consider specific solutions to be. That was the motivation behind this survey and we hope that you find the information in it useful.

If you enjoy this survey and find any aspects of it confusing or particularly interested, please let us know by emailing rob@shotgunsoftware.com. If you have ideas on how to make this survey more interesting and useful next year, please don't hesitate to get in touch.

Disclaimer

While this survey has gotten a significant number of people from across the industry, there is no implication that the results in this report are truly representative of the industry as a whole. This is an interesting sampling of studios from around the world, but extrapolating from this data set should be done with care and caution.

Overview

130 studios responded to this survey, representing over 21,000 artists and almost 2,000 TDs and engineers.

This report will dive into who those studios are (and who from those studios filled out the survey) before jumping into how those studios have invested in pipeline technologies (spending over \$27M per year to solve these problems).

We will then report back what value studios are realizing from that investment.

Finally we talk about some specific technologies and how the industry is adopting them.

1,894 TDs & Engineers

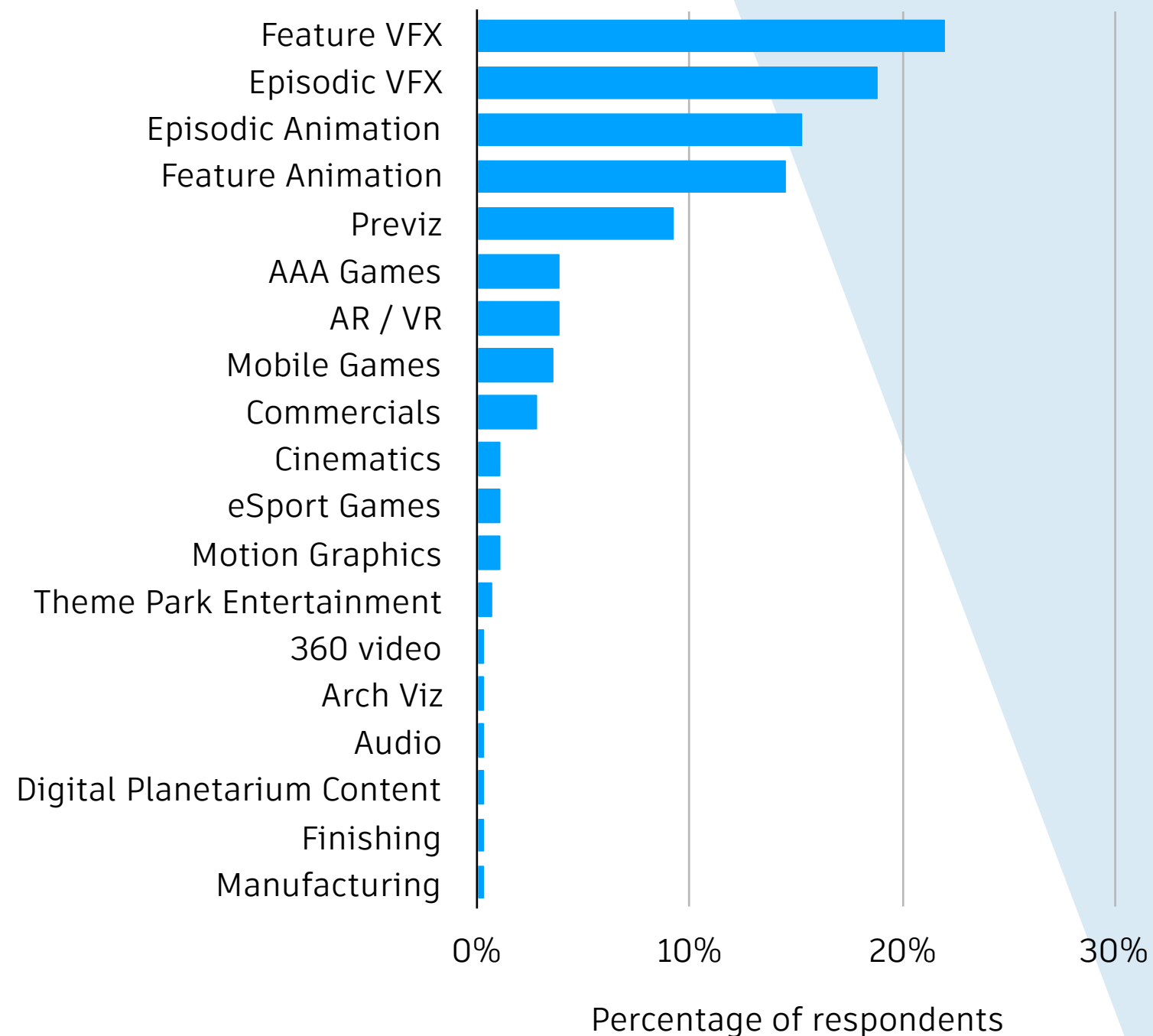
21,113 Artists

130 Studios

**\$27,218,024 US dollars
per year investing in
pipeline**

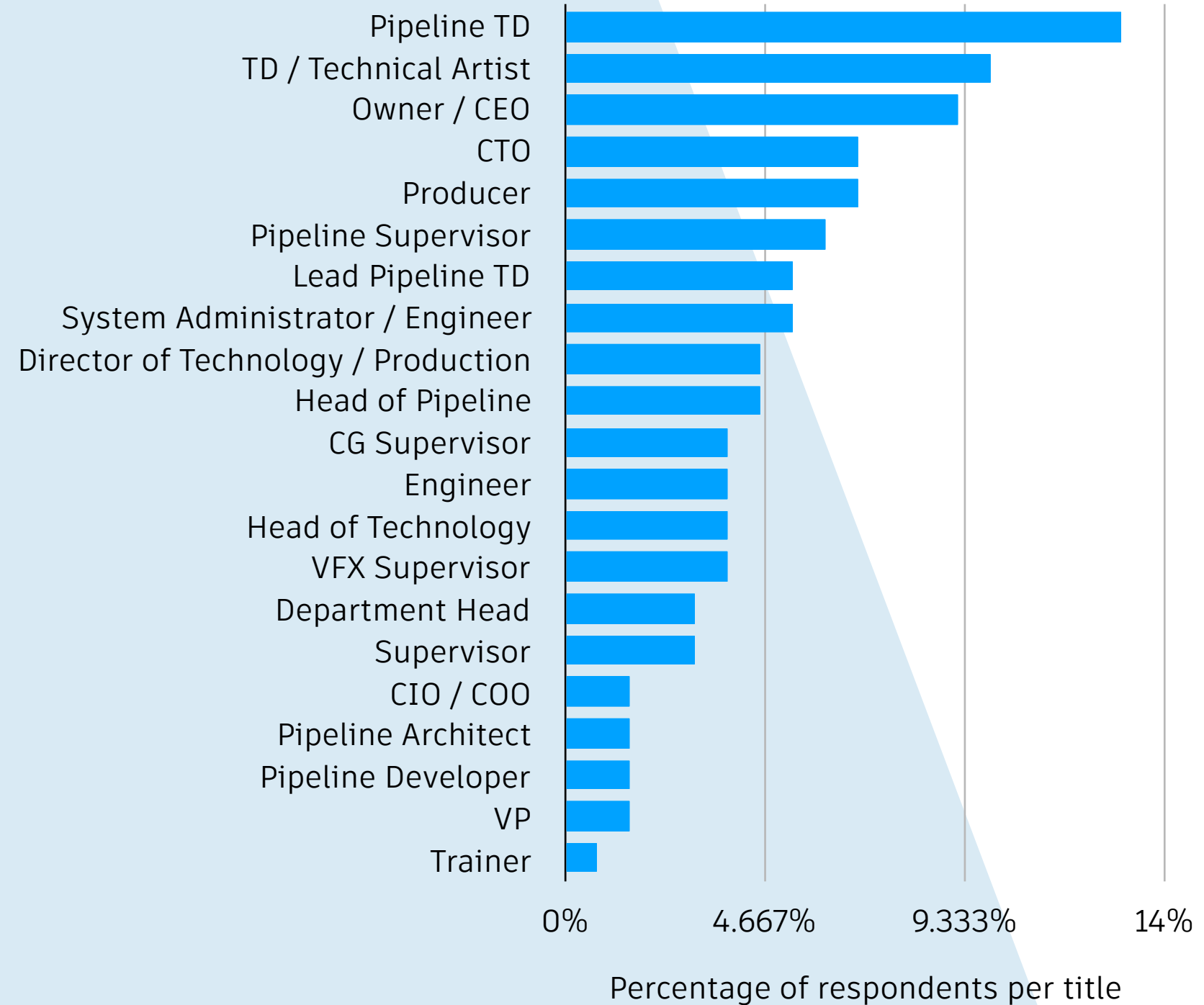
Who answered the survey

Type Of Work



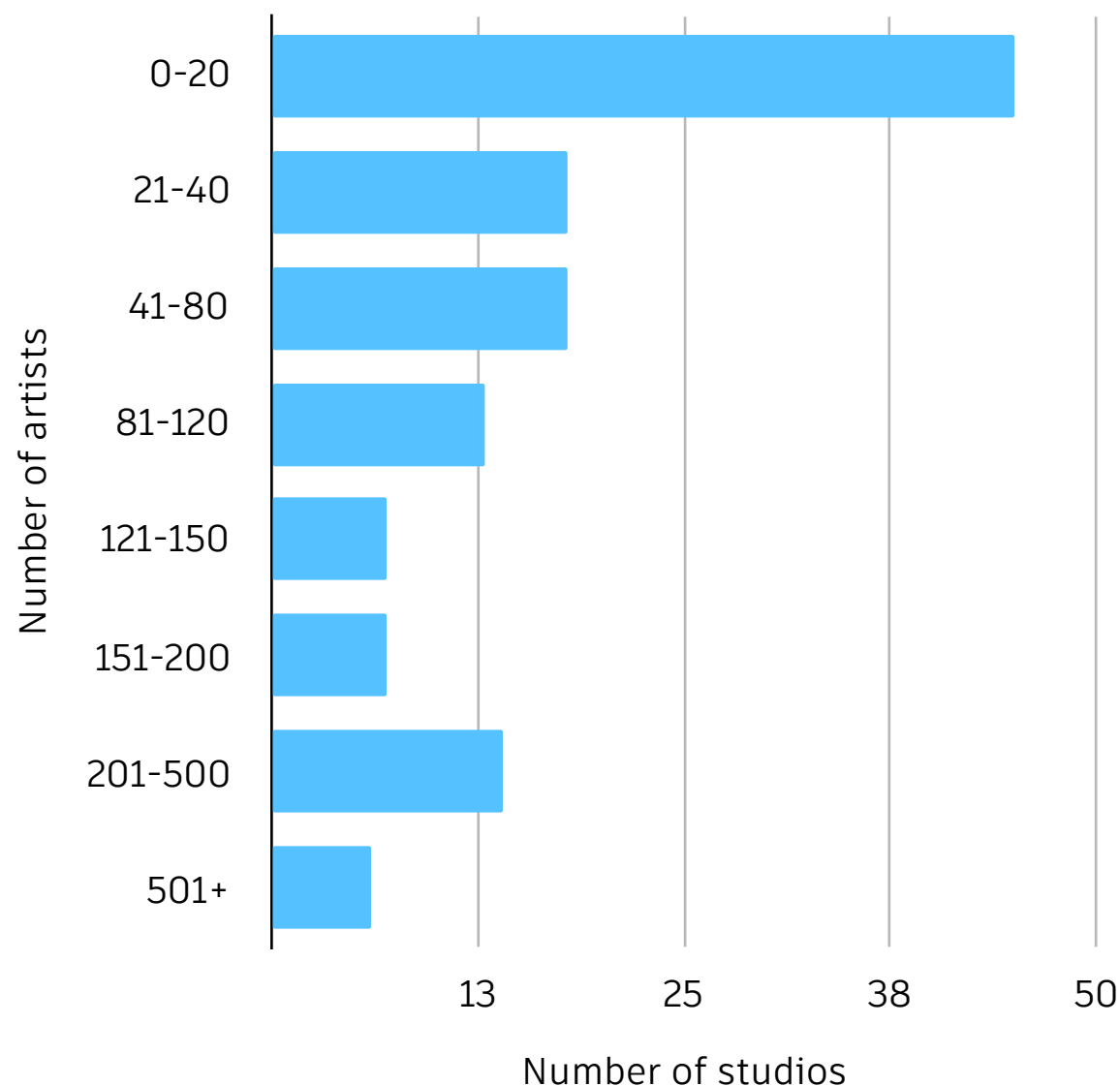
The survey covers studios involved in delivering many types of media. Most studios who responded worked on multiple types of projects, with only a few who truly specialized. While the bulk of the survey represents VFX and animation studios, there are game studios and other disciplines who are starting to be interested in pipeline.

Responder's Role



While the bulk of the respondents are direct contributors to pipeline technologies, a significant number of respondents are in leadership positions in the studios they come from.

Studio Size Artists

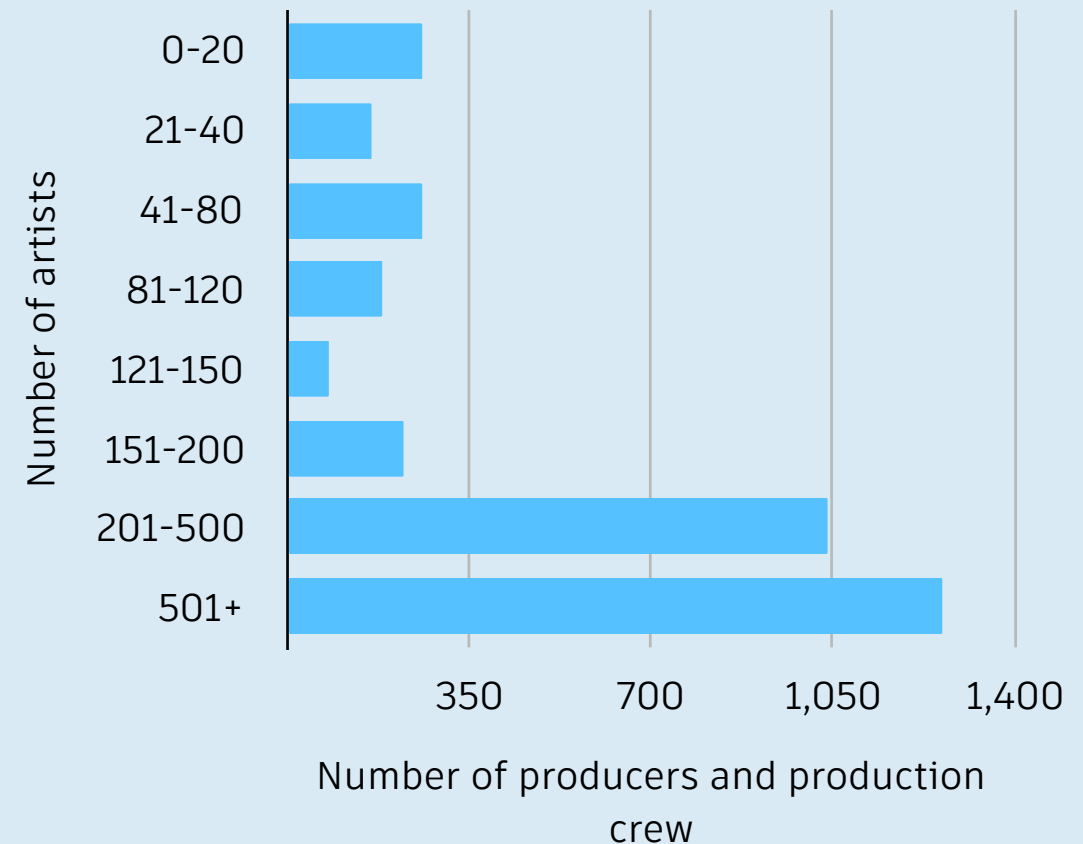
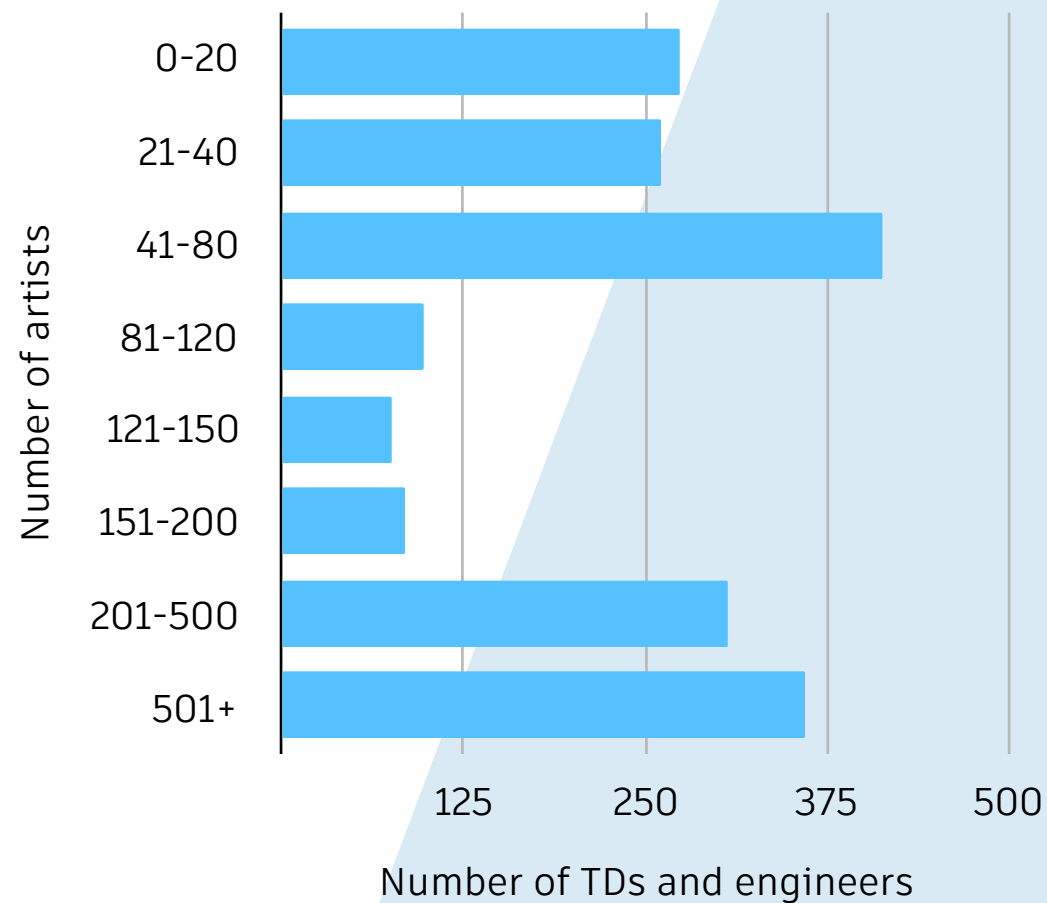


The studios who responded to the survey were mostly small studios, with over twice as many studios with under 20 artists as any other similarly sized bucket.

While the smallest studios had just a couple artists, the largest studios represented had over 3,000 artists on staff. On the whole the studios responding to the survey reportedly have 21,113 artists working for them.

Studio Size

TDs and Production



The studios in the survey employ 1,894 TDs & engineers and 3,470 producers and production crew.

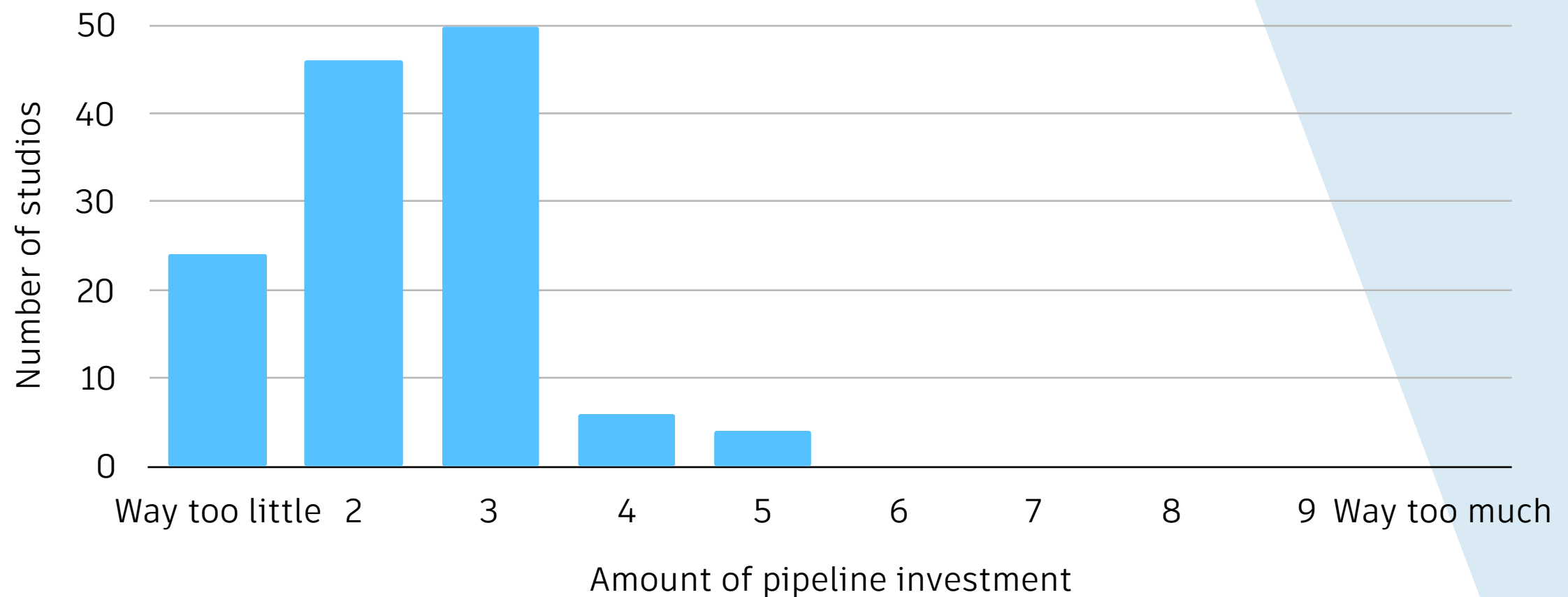
On the whole this represents about a **1:4** ratio between the crew helping to make artists more efficient and the artists themselves (note this ratio does grossly oversimplify the contribution that the various roles make).

How and why have they invested in pipeline

Appropriate Spend

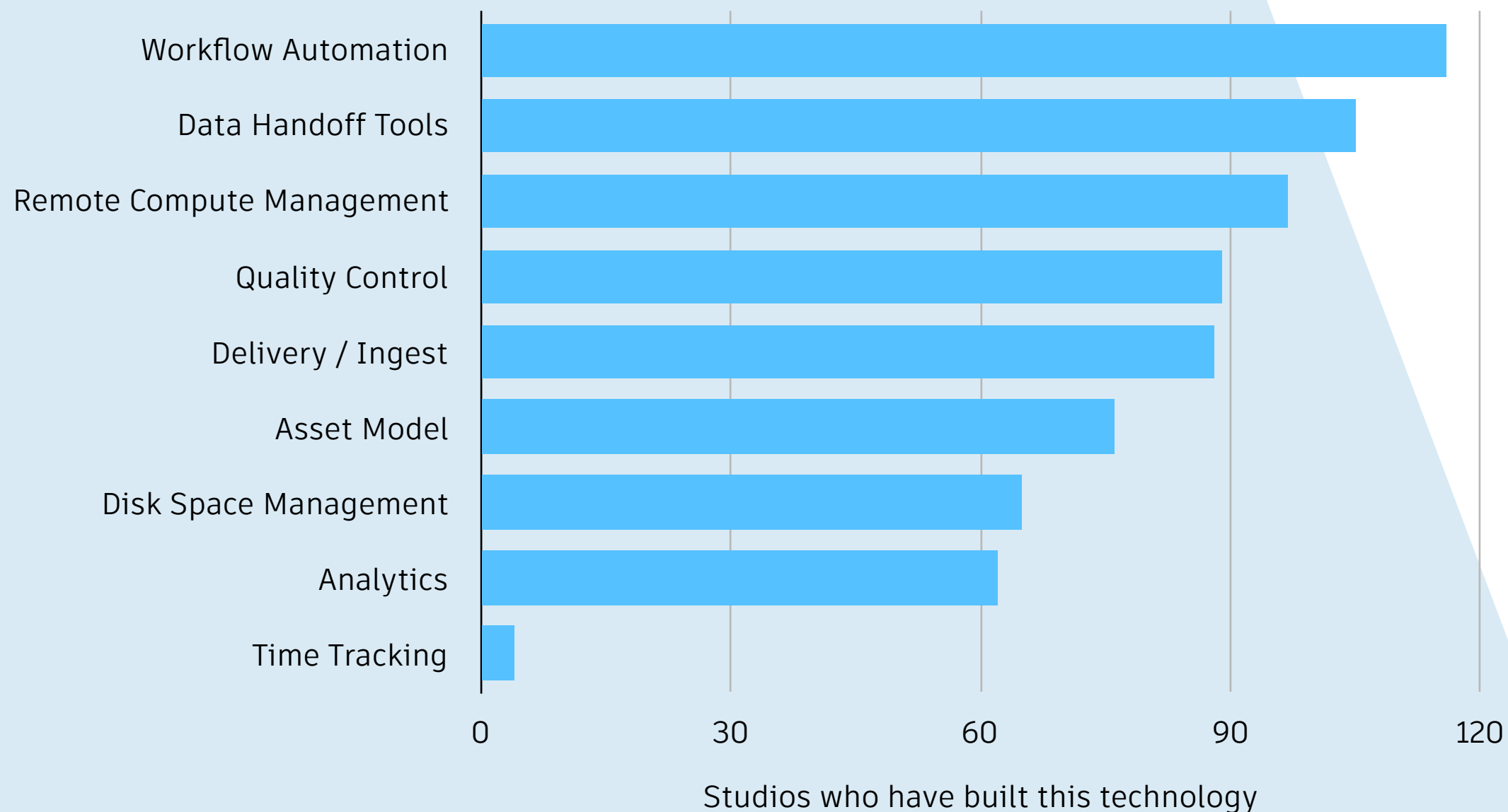
While there was a significant spend on pipeline related technologies, most studios report that they think they spend too little on these problems.

A few studios thought that they spent an appropriate amount on pipeline, but no studios thought that they were overspending in this area.



Technology Investments

The following chart relates which technologies studios have invested in building themselves. While in many cases these investments are built on top of publicly available foundations (such as render farm management software), studios have built their own custom pipelines on top of those foundations.



Notable Quotes On Investments

“Small studios don't tend to invest enough in pipeline development”

“Building things that we should be buying”

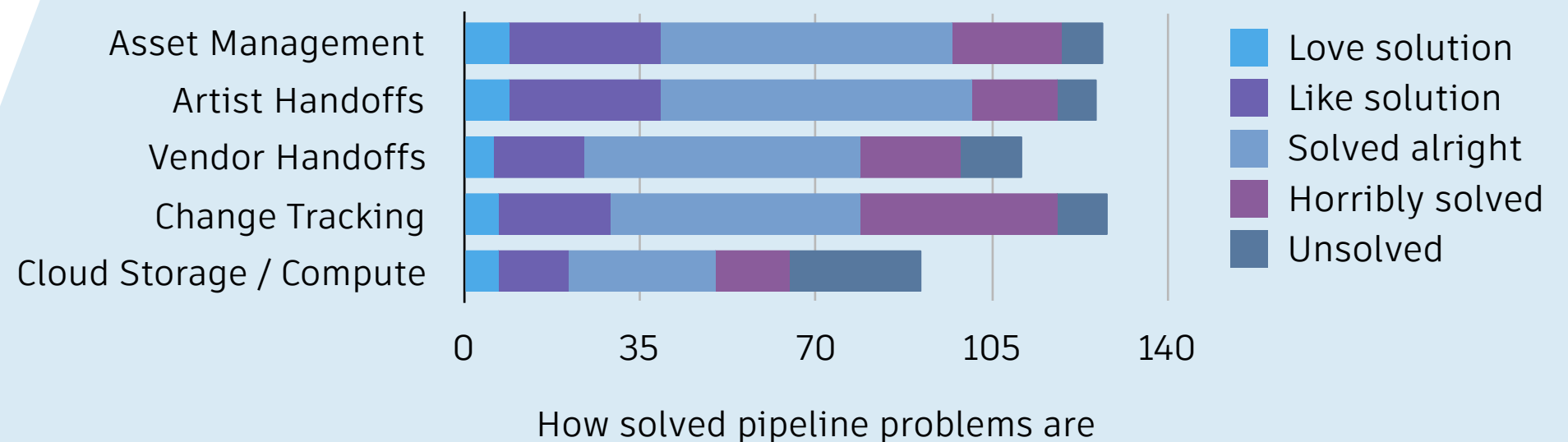
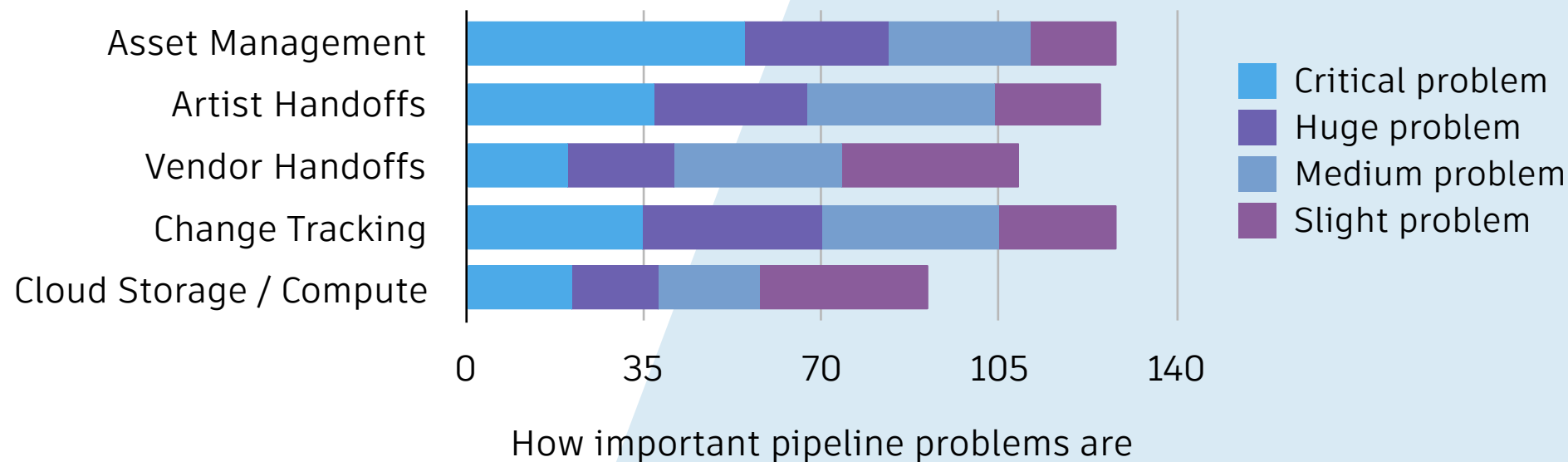
“Very often a whole lot of work has to be done over and over again since small productions often ‘throw everything away’ as soon a production is over.”

“Our historic investment on in-house tools has not panned out in major areas such as asset management and change tracking to name a couple.”

“Spend a lot of time on legacy/technical debt even for a relatively new company.”

**What they have gotten for their
investment**

Importance and Satisfaction

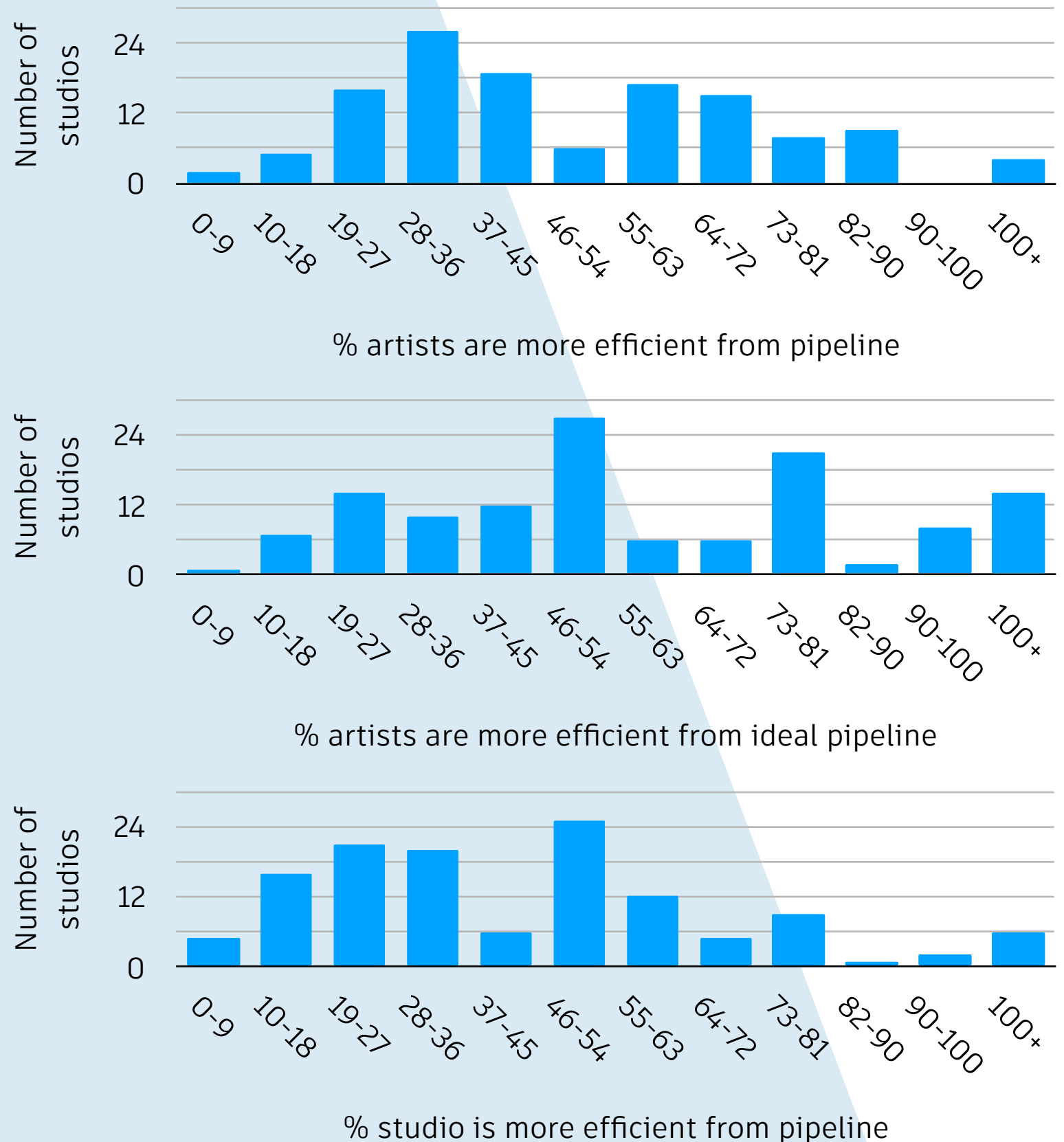


Asset management, artist handoffs, and change tracking were considered the most critical problems to be solved. These are the same areas where satisfaction with the current solution is the highest, although only a minority of studios reported high satisfaction with their solution.

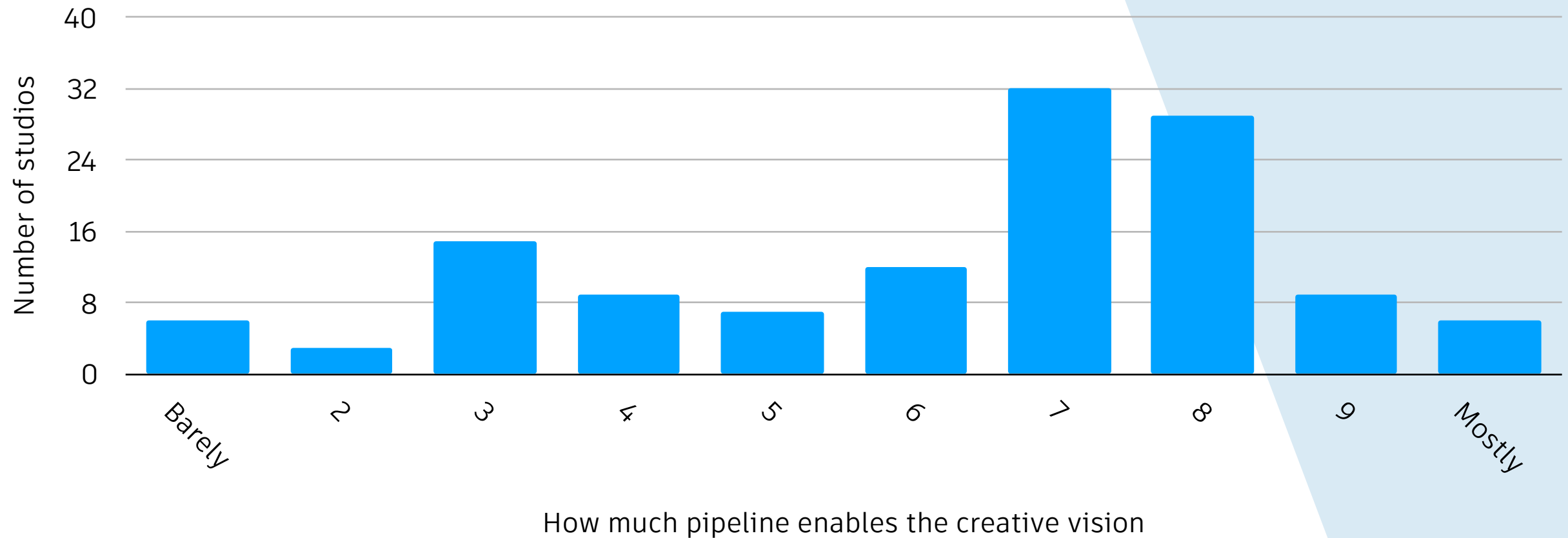
Increased Efficiency

In general, studios are optimistic about how much more efficient pipeline technologies make them and their artists.

On average, studios thought that their artists were 40% more efficient because of their pipelines while an ideal pipeline would make their artists 56% more efficient.



Enabling Creative Output



In general, studios report that pipelines are significant contributors to being able to deliver their creative targets. The average score on a scale where 1 is that the pipeline makes no difference to the creative output and a 10 is that the creative output would be impossible without the pipeline is 6.2.

Notable Quotes On Value

**“Literally couldn't do the job
without our pipeline”**

**“Great ROI; improves efficiency,
consistency, quality, and
throughput at every level.”**

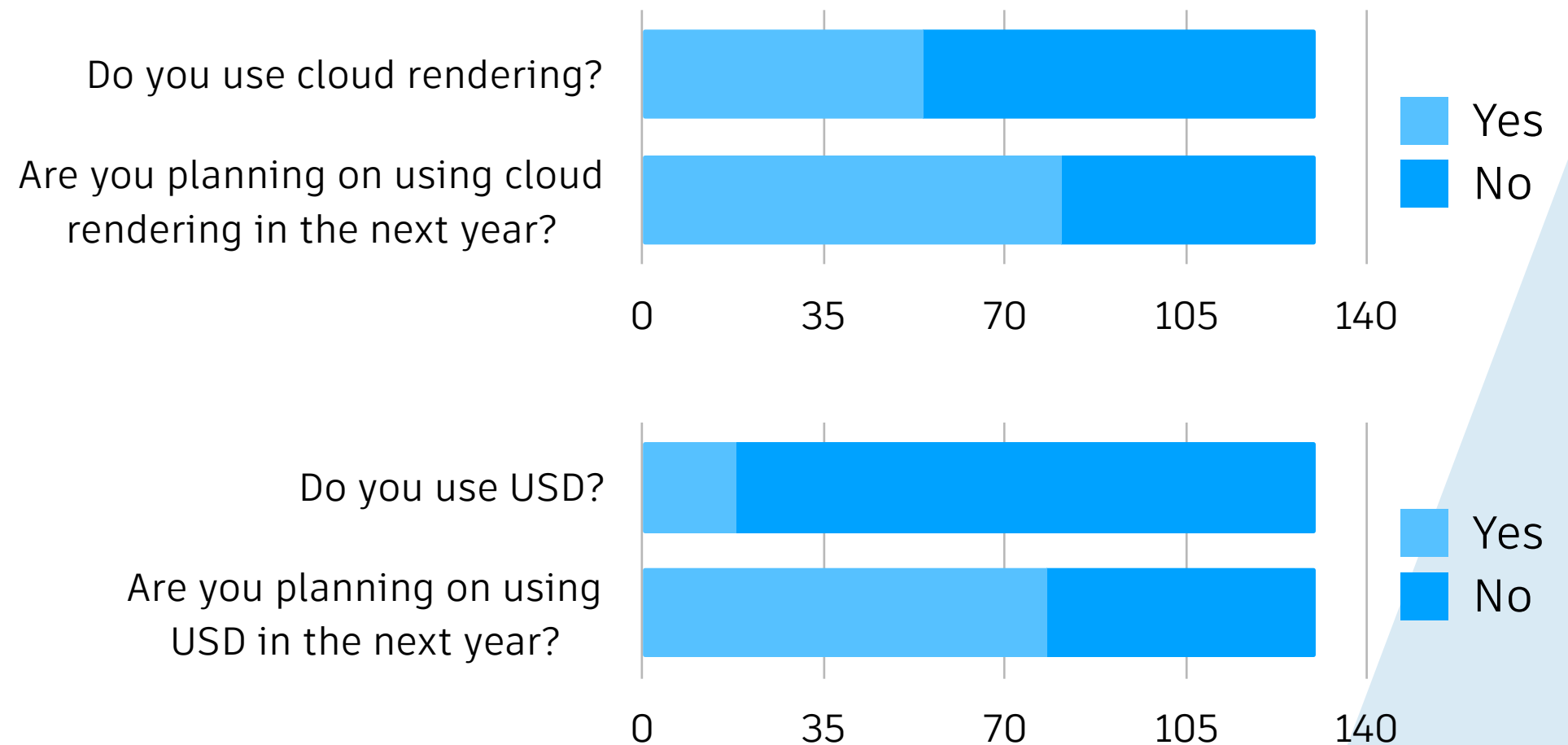
“We punch above our weight class”

**“Workflow is king. If the
workflow is incredible, all are
positively impacted.”**

**“We've been able to compete
with larger studios pretty
successfully by paying
attention to tools and
workflow.”**

Pipeline technologies

Technology Adoption



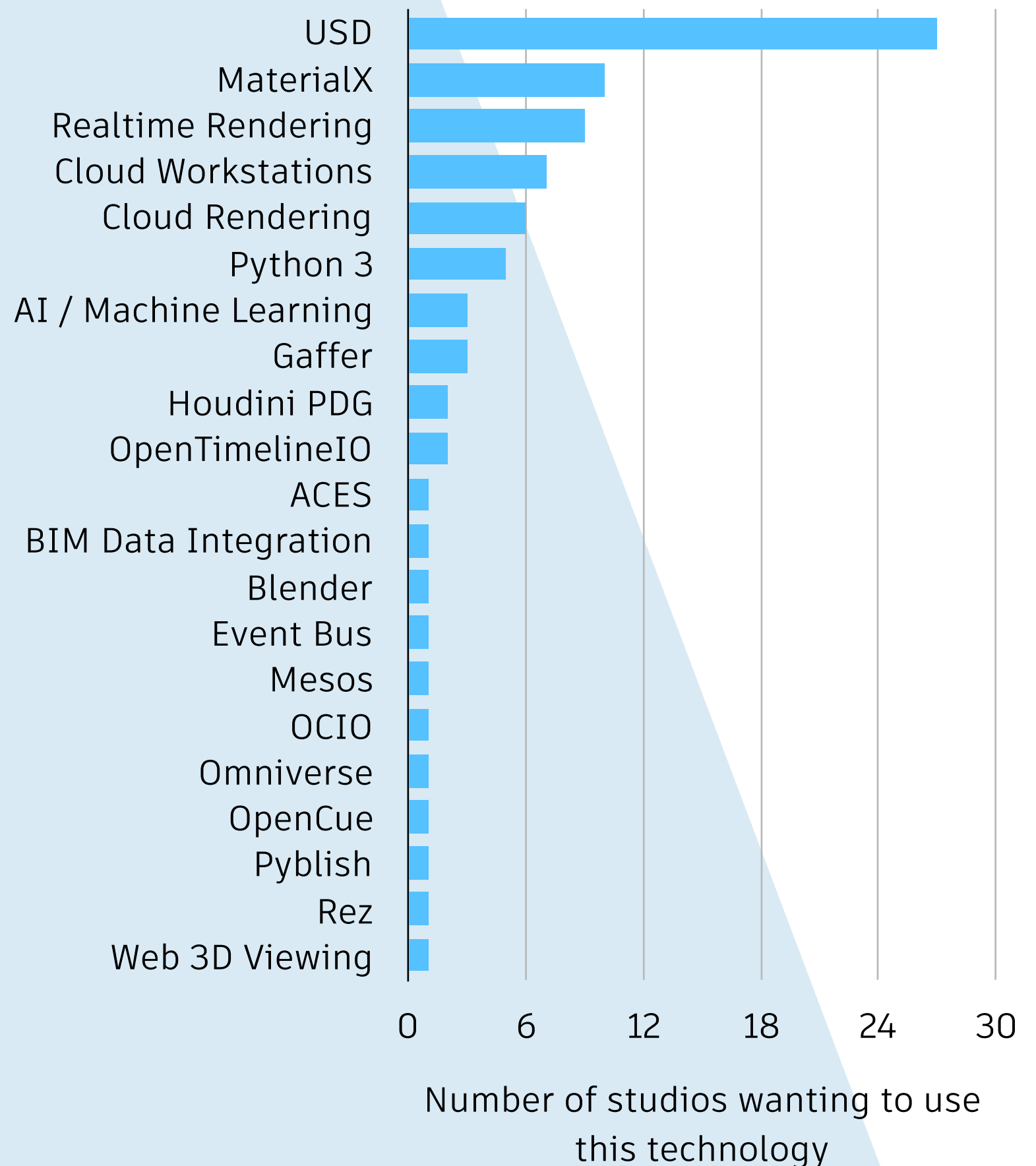
While there was some delta between studios who are currently using cloud rendering and studios who are planning on using cloud rendering, the difference was relatively small. It is possible that most studios that would like to use cloud rendering have already made the transition to that technology.

There was a much greater delta between studios who are currently using USD and studios who plan on adopting USD. While only 10% of studios who responded are currently using USD, 60% plan on adopting USD in the next year.

Anticipated Technologies

USD also topped the list for the most anticipated technology. As this was an optional and freeform text question, not many studios answered this question.

Even so, MaterialX, realtime rendering, and workstations in the cloud received significant attention.



Notable Quotes On Technologies

“Cloud solutions are horribly fragile in internet-restrictive satellite locations (e.g. China)”

“As much as cloud-computing becomes a bigger part of pipeline solutions, we keep facing clients that raise security concerns and limit the usage of such systems.”

“Because we use cloud workstations we don’t have to spend much time or money developing the pipeline“

“Because we are working completely in the cloud we’d love to have metered licensing for DCC’s.”

“Love and contribute to open source tools. Hate reinventing the wheel.”

Proposed changes for next year

Overall, the response to the survey has been exciting to see. In the course of running the survey it did become obvious that there are improvements that should be made for the next cycle. Additionally there were good questions that the respondents suggested for inclusion.

The next pipeline survey will likely include the following changes:

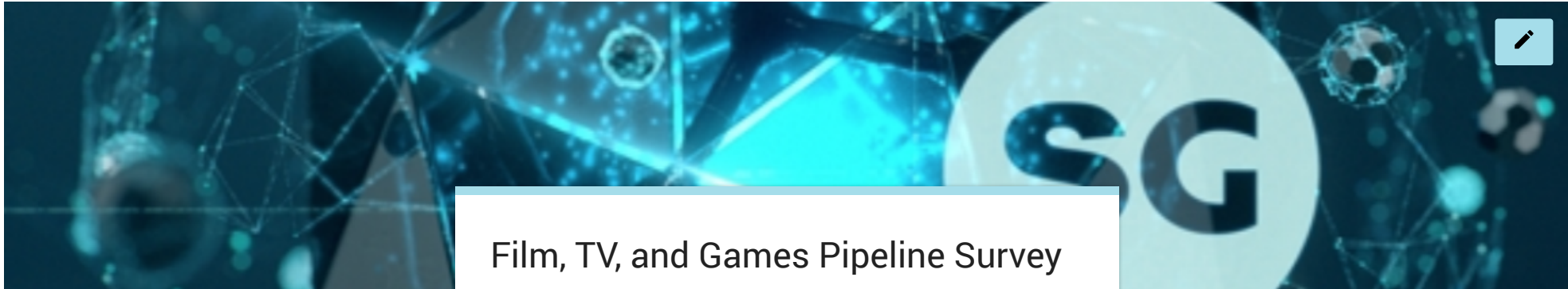
| |
|--|
| Tech: Ask what programming languages are in use. |
| Tech: Ask what languages user interfaces are programmed in. |
| Tech: Ask if any virtualization and containerization technology is in use. |
| Tech: Ask about Python 3 adoption. |
| Studio: Ask how current studios keep their applications. |
| Studio: Ask is artists have internet access, and if how if it is limited. |
| Studio: Ask for the studio location(s) for a geographic breakdown. |
| Studio: Separate out a section for vendors offering pipeline related software and services. |

If there are more changes that you would like to see, please email them to rob@shotgunsoftware.com.

Conclusion

I hope you enjoyed reading through this report and found the contents both interesting and useful. It was a fun survey to run, and I am looking forward to being able to make it into a tradition and see how both the survey and the answers to its questions evolve over time.

Appendix: The Survey



Film, TV, and Games Pipeline Survey

* Required

Email address *

Your email



About this survey

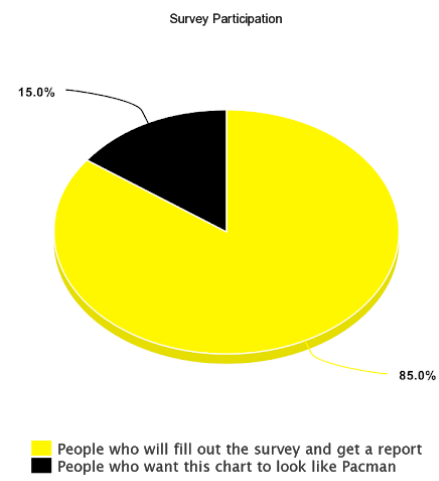
Some of the biggest issues facing our industry have to do with representing and organizing the ever more complex assets we build to make them easier to work on and handoff. This survey collects information about what our collective investment in solving these problems is and what benefits we are seeing from that investment.

We will send out this survey every year and track how our approach to these problems is changing over time.

The results of the survey (with the data anonymized and aggregated) will be shared out to everybody who replies. We are also going to select 5 random respondents who will each receive a \$100 Amazon gift certificate.

We'll be closing the survey at the end of March and will send out the resulting report in early April.





meta-chart.com

About you

What is your name? *

Your answer

What studio do you work at? *

Your answer

What is your role at the studio? *

Your answer

About your studio





What kind of work does your studio do? *

☐ Feature VFX

☐ Episodic VFX

☐ Feature Animation

☐ Episodic Animation

☐ Previz

☐ eSport Games

☐ AAA Games

☐ Mobile Games

☐ Other: _____

About how many TDs/engineers work at your studio? *

Your answer

About how many artists work at your studio? *

Your answer

About how many production people (producers, coordinators, etc.) work at your studio? *

Your answer

Does your studio have multiple locations? *

☐ Yes

☐ No

How many other studios did you work with in the last year? *

Your answer

About your pipeline investment

How many people do you have doing pipeline work? *

Your answer

What pipeline investments have you made (not bought)? *

- ☐ Work sharing tools (Data handoff from artist to artist)
- ☐ Asset model and representation (Understanding and managing the contents of scenes)
- ☐ Workflow automation (Tools to wrap up a series of steps to run, potentially automatically triggered)
- ☐ Disk space management (Use disk space efficiently and don't fill it up)
- ☐ Compute submission and management (Submit work to the render farm and manage it)
- ☐ Quality control (automatic checks and validation on the work done)
- ☐ Delivery / Ingest (tools to hand work off to or accept work from other studios)
- ☐ Analytics and reporting for production (Inventory tracking, resource utilization, track the cost of a change)
- ☐ Other: _____

How long do you need to train your artists for them to be able to use your pipeline (in days)? *

Your answer



Do you feel like you are investing the right amount in pipeline? *

1 2 3 4 5

We are spending way too little on pipeline ☐ ☐ ☐ ☐ ☐ We are spending way too much on pipeline

What is your estimated cost (in US Dollars) per year on pipeline development?

Your answer

Anything else about your pipeline investment you want to note?

Your answer

About your pipeline returns

How much more efficient do you think your studio is because of your pipeline (% of overall spend saved because of pipeline tools)? *

Your answer

How much more efficient do you think your artists are because of your pipeline (% of their capacity that is there because of pipeline tools)? *

Your answer

How much more efficient do you think your artists could be using an ideal pipeline (% of their capacity that is there because of pipeline tools)? *

Your answer



How much does your pipeline contribute to achieving your creative leadership's or client's vision? *

1 2 3 4 5 6 7 8 9 10

We could achieve it without the pipeline

The look would be impossible without our pipeline

How relevant are these pipeline technologies to your studio? *

| | Doesn't Apply | Is a slight problem for us | Is a medium problem for us | Is a huge problem for us | Having a good solution is critical |
|-----------------------------------|---------------|----------------------------|----------------------------|--------------------------|------------------------------------|
| Asset management | <div></div> | <div></div> | <div></div> | <div></div> | <div></div> |
| Artist to artist Handoffs | <div></div> | <div></div> | <div></div> | <div></div> | <div></div> |
| Vendor handoffs | <div></div> | <div></div> | <div></div> | <div></div> | <div></div> |
| Change tracking and notification | <div></div> | <div></div> | <div></div> | <div></div> | <div></div> |
| Access to cloud storage / compute | <div></div> | <div></div> | <div></div> | <div></div> | <div></div> |

How solved are these pipeline issues in your studio? *

| | Doesn't Apply | Completely unsolved | Horribly solved | Solved alright | We like our solution | We love our solution |
|-----------------------------------|---------------|---------------------|-----------------|----------------|----------------------|----------------------|
| Asset management | <div></div> | <div></div> | <div></div> | <div></div> | <div></div> | <div></div> |
| Artist to artist Handoffs | <div></div> | <div></div> | <div></div> | <div></div> | <div></div> | <div></div> |
| Vendor handoffs | <div></div> | <div></div> | <div></div> | <div></div> | <div></div> | <div></div> |
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| Access to cloud storage / compute | <div></div> | <div></div> | <div></div> | <div></div> | <div></div> | <div></div> |

Any other pipeline technologies or problems you'd like to note?

Your answer



Anything else you would like to note about the benefits you see from your pipeline investment?

Your answer

Specific topics in pipeline

Do you use cloud rendering? *

☐ Yes

☐ No

Are you planning on using cloud rendering in the next year? *

☐ Yes

☐ No

Do you use USD? *

☐ Yes

☐ No

Are you planning on using USD in the next year? *

☐ Yes

☐ No

What pipeline technologies are you looking forward to using?

Your answer

Wrap up



What pipeline questions would you like us to ask next time we send out this survey?

Your answer

Thanks

Thank you for the time you've spent on this survey. In a few weeks we will be collecting all the submissions and turning them into a report that we will send out to everybody who responded.

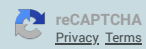
You'll be hearing from us soon!

Thank You.

A copy of your responses will be emailed to the address you provided.

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