



HARDWARE STARTUP REPORT

edition 2019

About the report

The goal of this survey was to crowdsource answers to all the questions regularly asked by our community of Hardware Club founders (manufacturing delays, CAC, size of option pool...). The scope and relevance of the questions have been reviewed and validated by 12 founders from the club.

This report only features a sample of the questions and answers provided, other key results will be made accessible only to the Hardware Club member startups.

The survey has been administered online during fall 2018 and only CEOs from the club were invited to participate.

To maintain consistency across answers only 80 responses out of 100+ were kept in order to produce the report.

The profile of the participants presented in the first section will give you an overview of the sample.

This report is not intended to provide general trends applicable to the whole hardware ecosystem since the size of the sample is limited. We wanted to share some interesting insights that haven't been documented so far.

If you have questions, you can contact Pénélope, associate & community director, at penelope@hardwareclub.co.

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**Pénélope ROMAND-MONNIER**

Associate & Community Director, Hardware Club

The idea of this survey had been in the pipeline for quite a long time. It only took a conversation with a founder last summer to finally kick off the project.

Since inception, Hardware Club has always been about providing a safe space for member startups to exchange resources, network and feedback. We wanted to find a way to gather and document the

information shared within the club and we consider this survey to be a first and humble step towards this goal.

We're excited to share some of the results with people who are passionate, interested or just curious about hardware. We hope you'll get some interesting food for thoughts that will spark new conversations on hardware startups.

I'd like to thank again the whole community for their support in making the project happen, and especially to the 100+ founders who participated. I know it took them tremendous courage and grit to go through the whole survey.

I'd like to thank as well the 12 fantastic founders from our review committee for their precious feedback and input. The survey would not have been possible without you! Big shout-out to Eric Dy from Bloomlife, Dorrian Porter from Vestaboard, Michele Baggio from Instamic, Omer Elfakir from Blocks, Pieter Palmers from MuuseLabs, Silas Adekunle from Reach Robotics, Suma Reddy from Farmshelf, Tristan Rousselle from Aryballe and Vipin Jain from Blendid.

Special mention to our amazing analyst Marta for her considerable help.

We hope you enjoy the reading!



The Hardware Club community today

410+

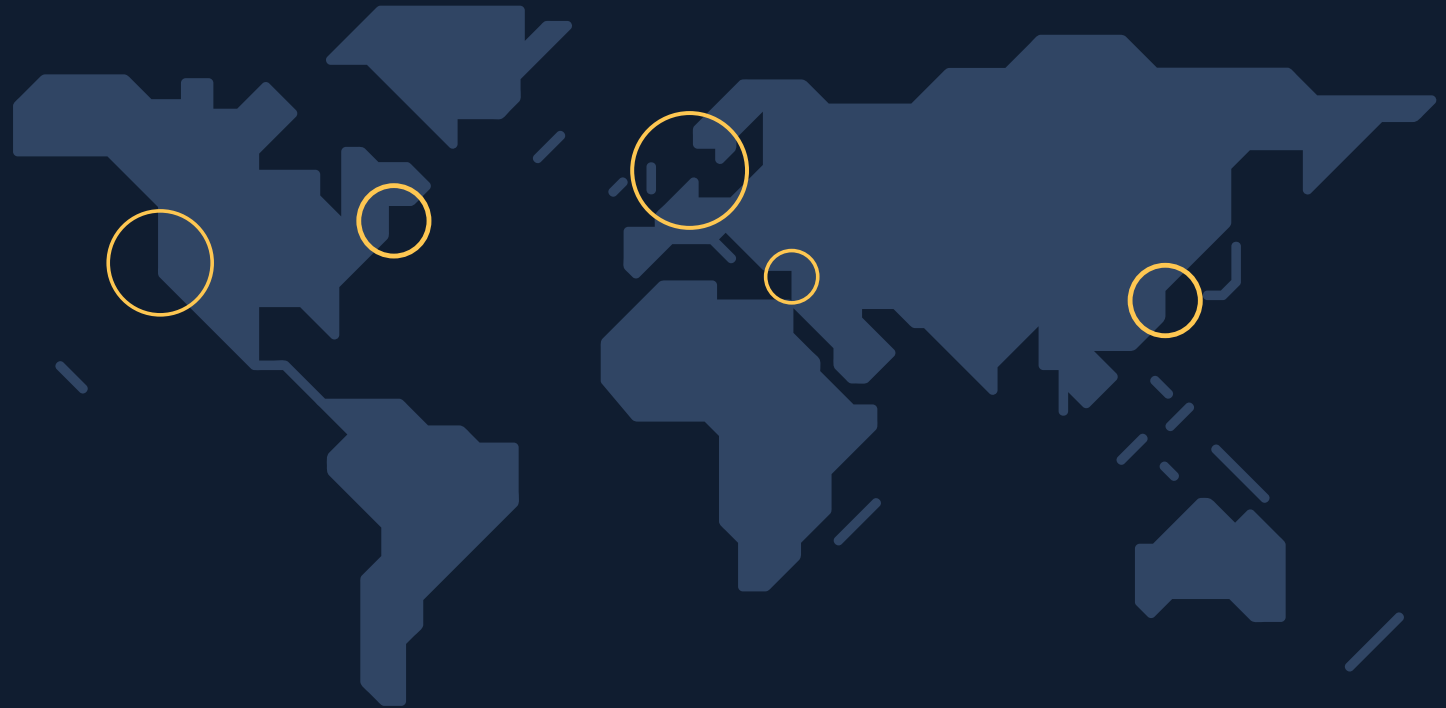
Active member startups

550+

Member startups

35+

Countries



INDUSTRIES

Agriculture

Audio

Communications

Computing

Construction

Education

Energy

Food

Gaming

Image

Industrial

Materials

Medical

Robotics

Security

Space

Sports

Toys

Transportation

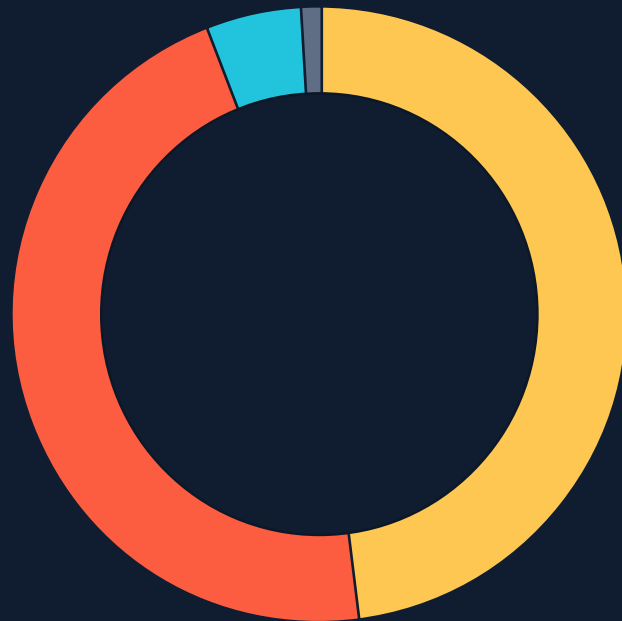
Wellness

02 SURVEY PARTICIPANT PROFILES

— Distribution of survey participants by location	6
— Distribution of survey participants by vertical	7
— Distribution of survey participants by market segment	8
— Distribution of survey participants by development stage	9
— Distribution of survey participants by last funding round	10

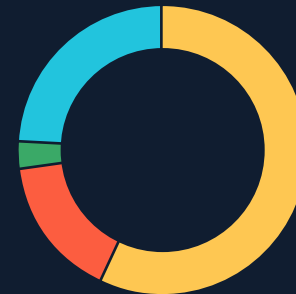
Distribution of survey participants by location

DISTRIBUTION OF RESPONDENTS BY GEOGRAPHICAL AREA



48% Europe
46% North America
5% Asia & Oceania
1% South America

DISTRIBUTION OF RESPONDENTS BY TECH HUB



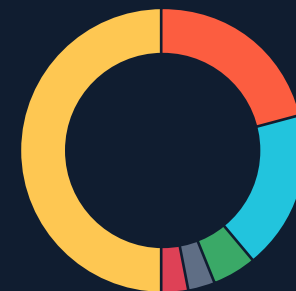
North America

57% Bay Area
24% Other cities
16% NYC
3% Boston



Asia & Oceania

50% Other cities
25% Hong Kong
25% Taipei

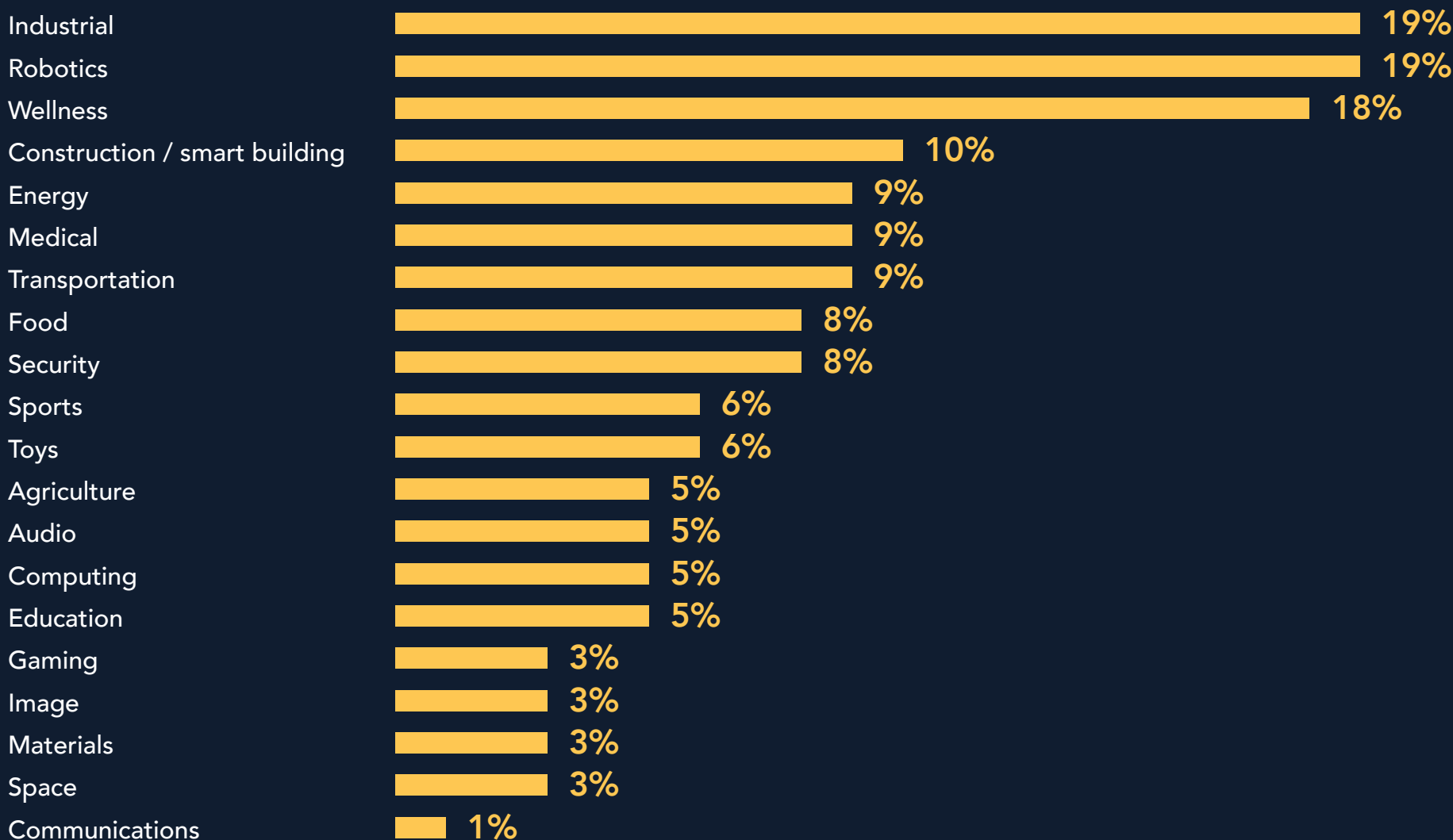


Europe

50% Other cities
21% Paris
18% London
5% Berlin
3% Lisbon
3% Stockholm

Distribution of survey participants by vertical

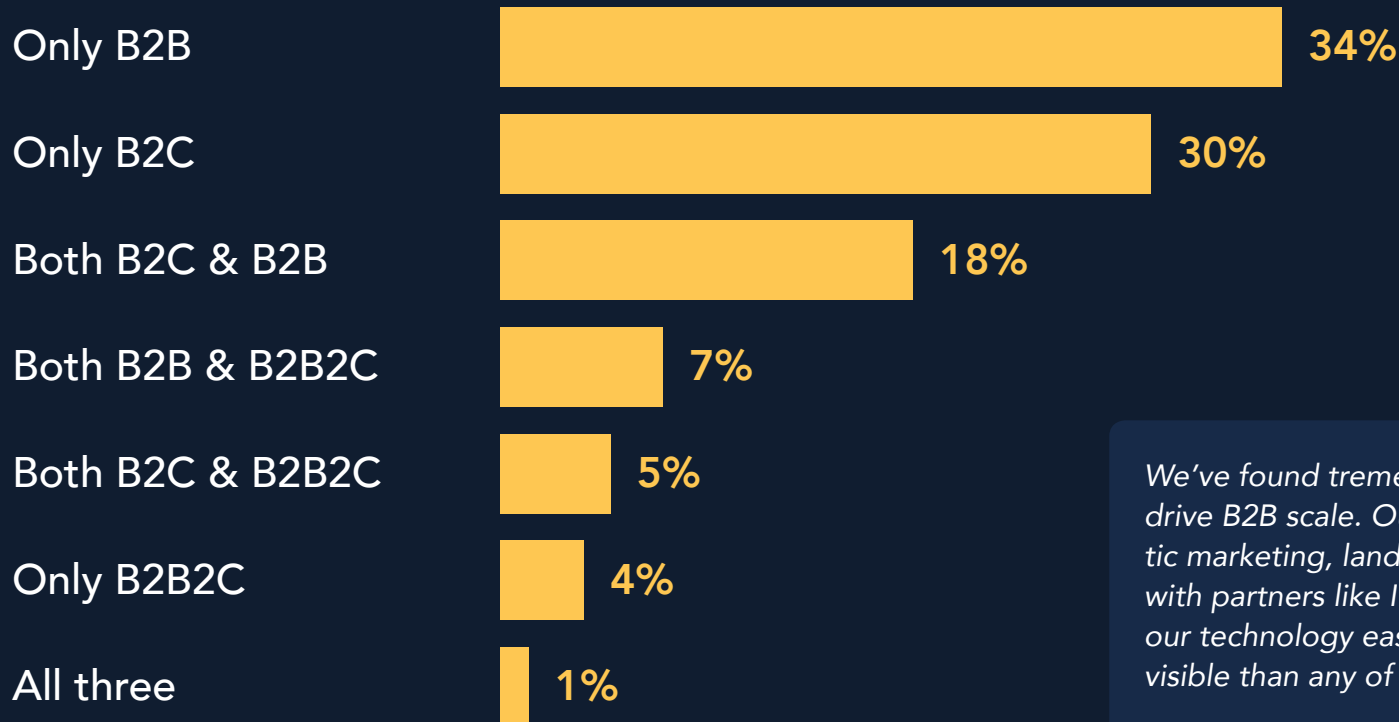
DISTRIBUTION OF RESPONDENTS BY VERTICAL



| **N.B.:** Companies could pick up to 3 answers among the list of verticals.

Distribution of survey participants by market segment

DISTRIBUTION OF RESPONDENTS BY MARKET SEGMENT



”
We've found tremendous success using B2C sales to drive B2B scale. Our B2C development kits are fantastic marketing, landing us valuable B2B licensing deals with partners like IKEA, DuPont, and BMW by making our technology easy to access, easy to test and more visible than any of our competitors.



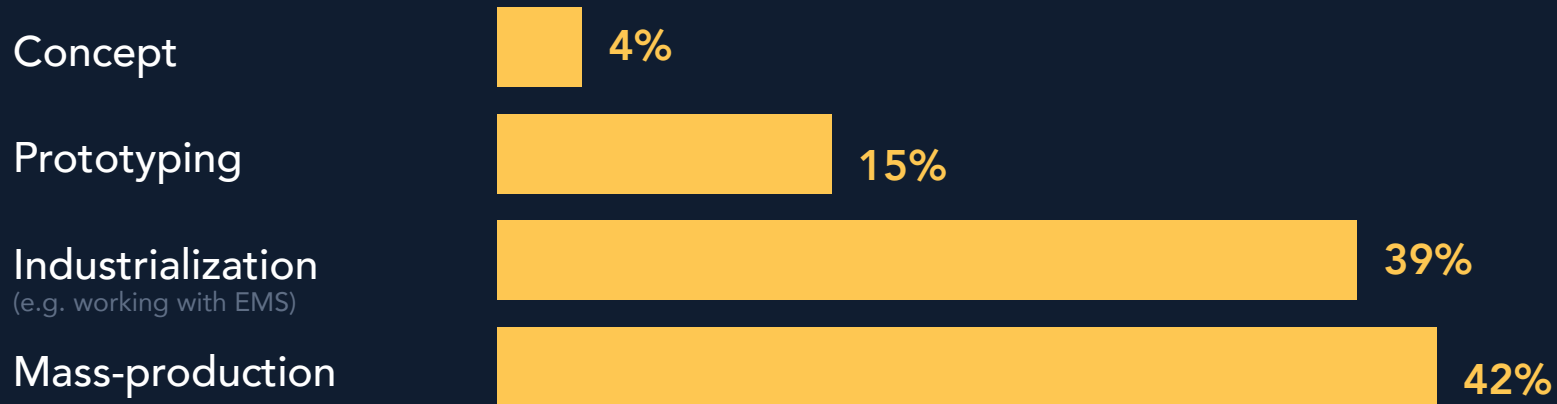
Matt Johnson

Cofounder & CEO - Bare Conductive

N.B.: Companies could pick up to 3 answers among B2C, B2B and B2B2C.

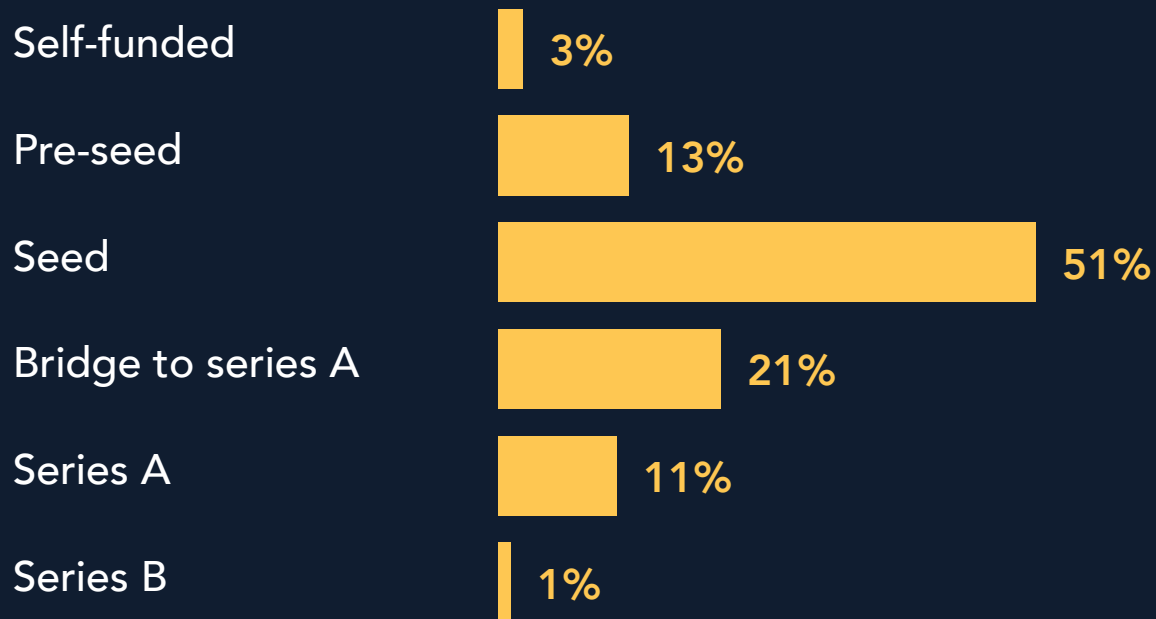
Distribution of survey participants by development stage

DISTRIBUTION OF RESPONDENTS BY DEVELOPMENT STAGE



Distribution of survey participants by last funding round

DISTRIBUTION OF RESPONDENTS BY LAST FUNDING ROUND



N.B.: Given the limited number of companies who are self-funded or at series B stage in the sample, we will not feature them in some of the analyses and charts.

03

MANUFACTURING & SUPPLY CHAIN

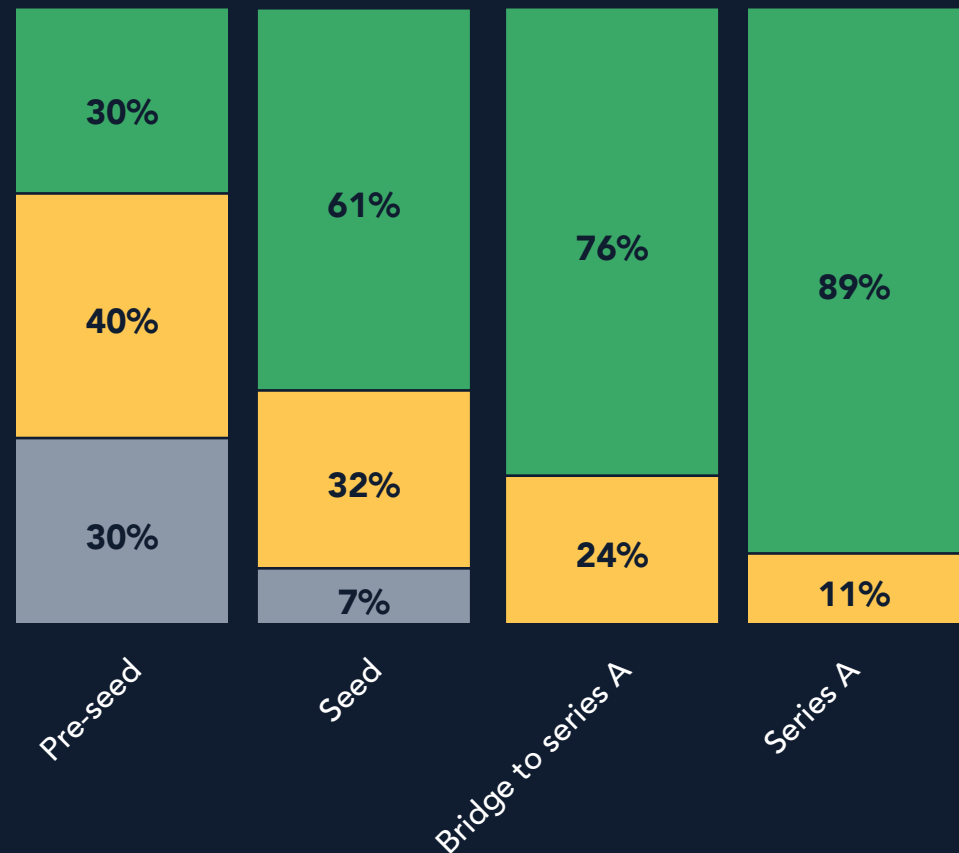
— Manufacturing happens at seed stage	12
— Almost 50% of the US startups are manufacturing in China	13
— Half of the European startups are manufacturing in China	14
— It takes 3+ months to find a contract manufacturer (CM)	15
— 65% of the startups found that their CM was involved in the development of their product	16
— Price is the most important factor when it comes to picking a manufacturer	17
— Ensuring the quality at every step and getting to DFM are the most difficult manufacturing challenges	18
— Back in Q4 2018, 91% of the US respondents were very or somewhat worried about the US tariffs	19
— Companies are on average late to ship by 3+ months	20
— Most companies (86%) protect their technology through patents	21
— Startups tend to fill more patent applications post Series A funding	22
— Half (51%) of the seed stage companies are shipping	23

Manufacturing happens at seed stage

24% of the respondents whose last round was a bridge to series A are still at a pre-manufacturing stage.

DISTRIBUTION OF RESPONDENTS BY MANUFACTURING STAGE AND LAST FUNDING ROUND

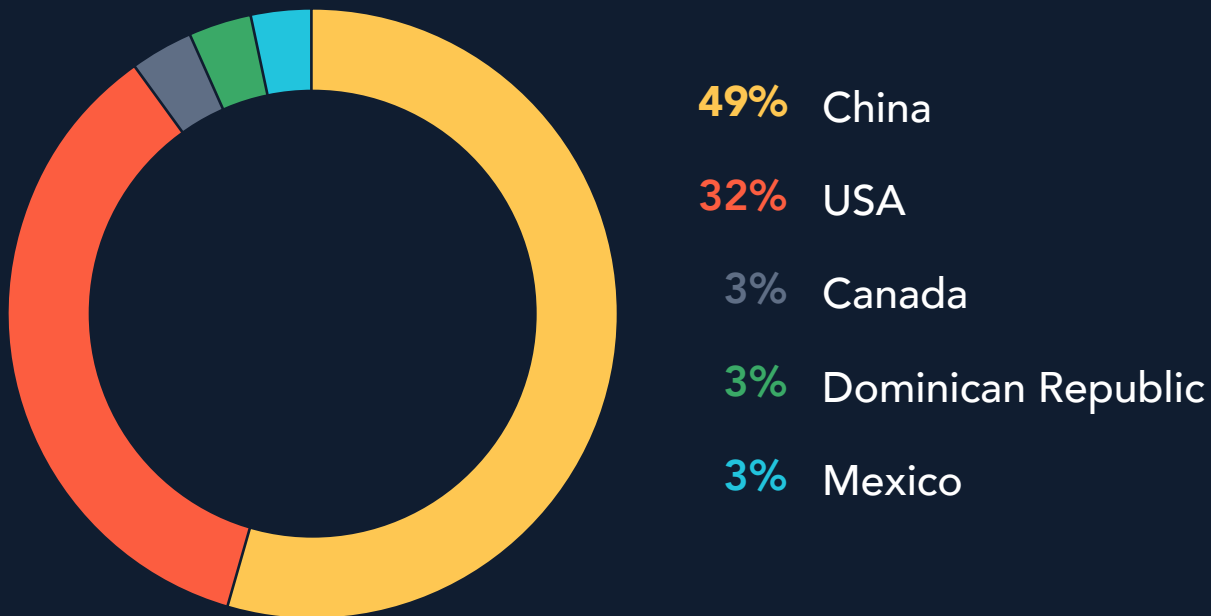
- Yes, we're currently manufacturing / we've already manufactured
- More or less, we're working on launching our first batch (sourcing manufacturers, vendors, etc.)
- No, we haven't started anything related to manufacturing



Almost 50% of the US startups are manufacturing in China

Only 32% of the USA-based surveyed startups are manufacturing locally.

DISTRIBUTION OF MANUFACTURING LOCATIONS FOR US RESPONDENTS



”
At Bellwether Coffee we had less expensive manufacturing options in Asia. We chose to manufacture in the US where we can iterate designs faster, create a shorter supply chain, and ship product to customers faster.

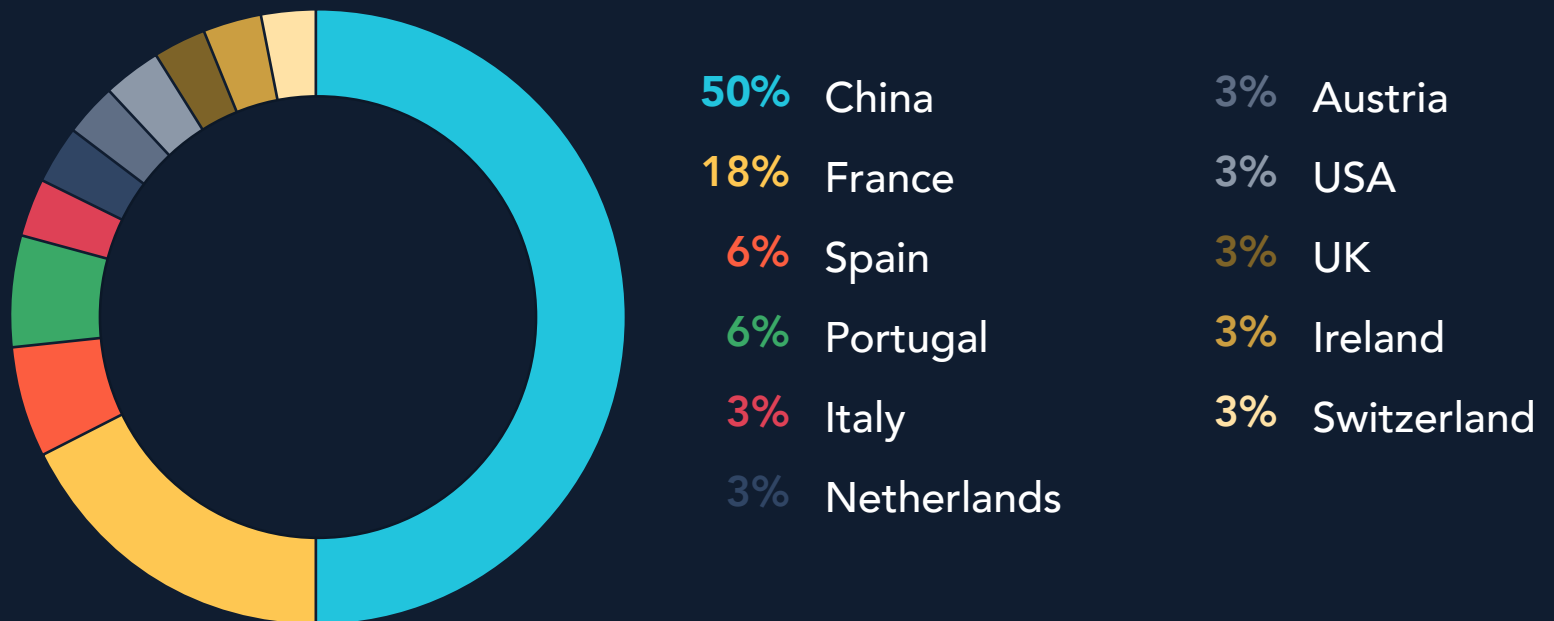


Nathan Gilliland
CEO - Bellwether

Half of the European startups are manufacturing in China

China is a manufacturing destination as popular among the US respondents as among the European ones (respectively 49% and 50% are manufacturing in China).

DISTRIBUTION OF MANUFACTURING LOCATIONS FOR EUROPEAN RESPONDENTS



It takes 3+ months to find a contract manufacturer (CM)

Companies found their CM (Contract Manufacturer) primarily through active searching (24%). Only 8% of the respondents found their CM through their investors or incubator / accelerator.

DISTRIBUTION OF RESPONDENTS BY SOURCE OF INTRODUCTION TO CM

Average time to find a CM

14.4
weeks



N.B.: The answer "Other (please specify)" includes: vendor, industrial design firm, Hardware Club, the startup manufactures itself, mentor, friend.

65% of the startups found that their CM was involved in the development of their product

17% of the respondents decided not to involve their manufacturing partner.

DISTRIBUTION OF RESPONDENTS BY LEVEL OF INVOLVEMENT OF THEIR CM



Price is the most important factor when it comes to picking a manufacturer

The manufacturer's capabilities only comes in the 4th position.

WHAT ARE / WERE THE 3 MOST IMPORTANT FACTORS WHEN CHOOSING YOUR CM?

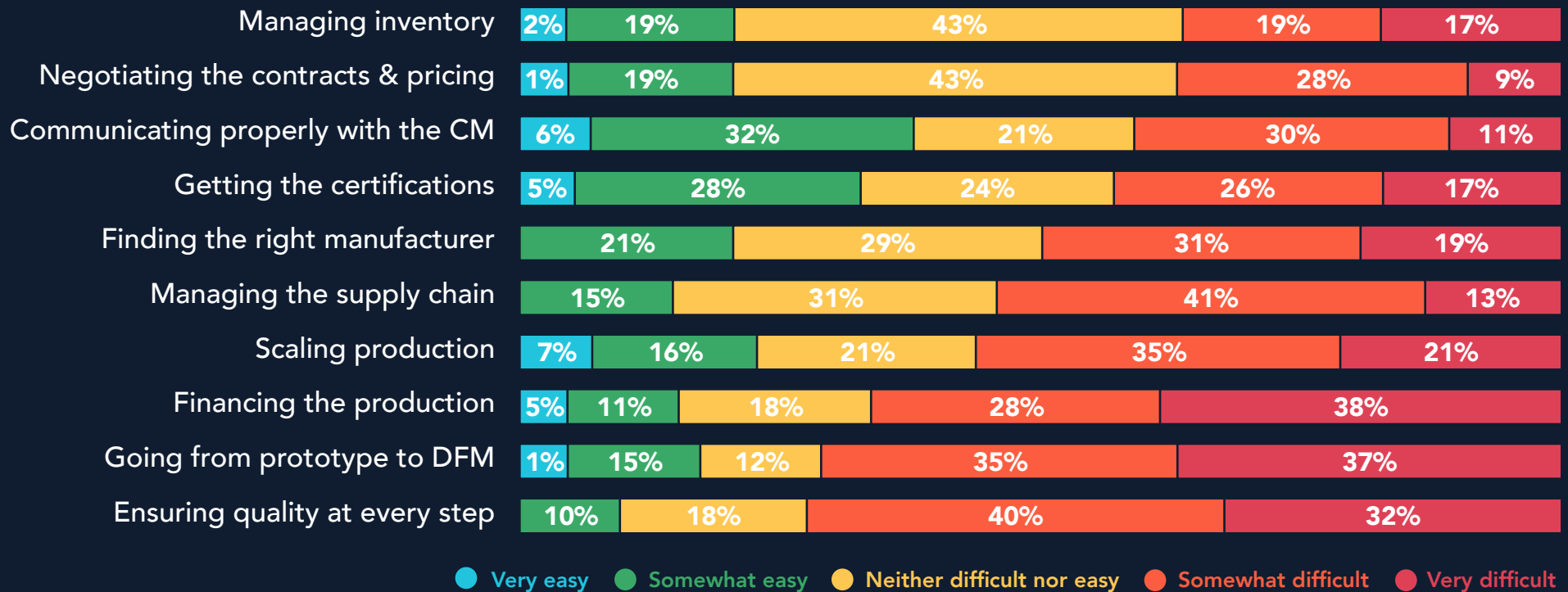


| **N.B.:** Companies could pick up to 3 criteria among the list.

Ensuring the quality at every step and getting to DFM are the most difficult manufacturing challenges

Financing and scaling the production are the next two biggest roadblocks that hardware startups face.

HOW DIFFICULT OR EASY WERE THESE ASPECTS OF THE MANUFACTURING PROCESS?

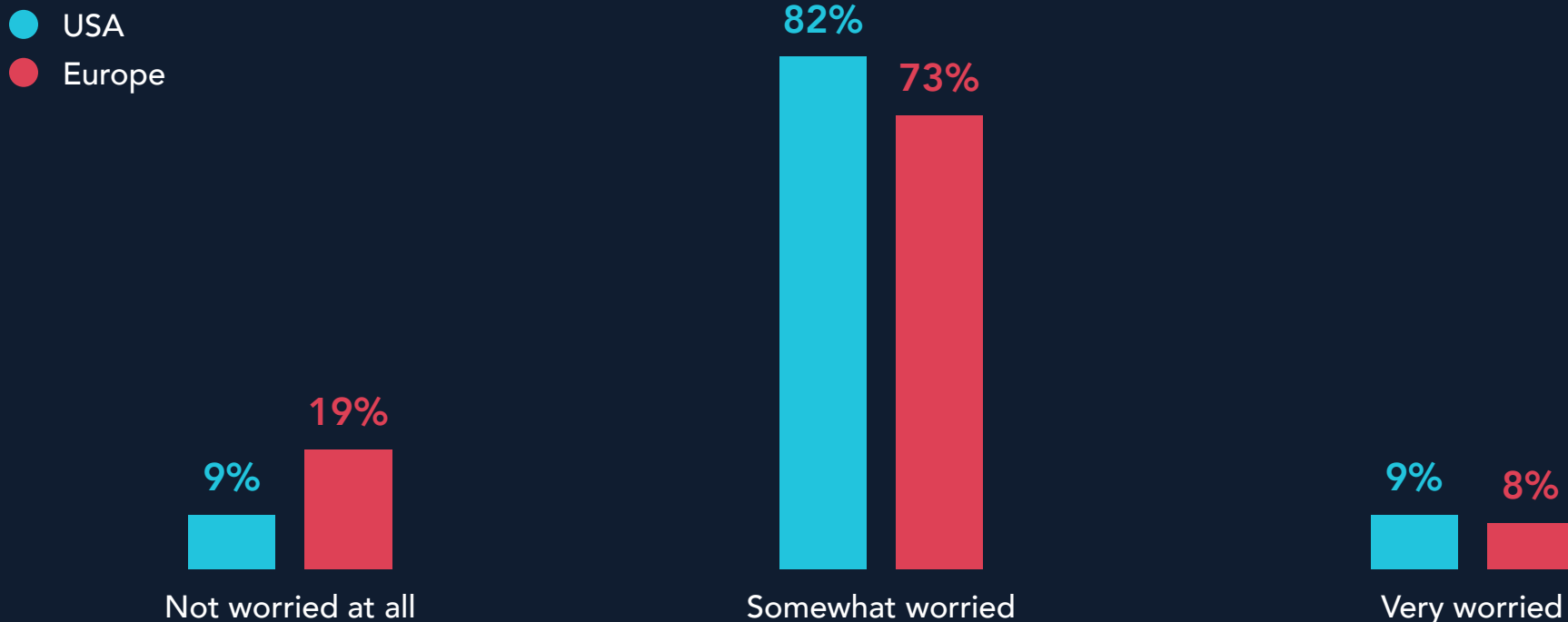


Back in Q4 2018, 91% of the US respondents were very or somewhat worried about the US tariffs

9% of the USA-based respondents were very worried about the tariffs, which is only 1% more than Europe-based startups (8%).

Among US founders, there were as many respondents not worried at all about the tariffs than there were that were very worried (9%).

DISTRIBUTION OF LEVEL OF WORRY REGARDING THE US TARIFFS BY GEOGRAPHICAL AREA



Companies are on average late to ship by 3+ months

The company, the suppliers and the manufacturer cause each an average delay of between 7.5 and 9 weeks.

Average delay to ship

15.6
weeks

Average delay to ship due to

THE COMPANY

8.8
weeks

Average delay to ship due to

THE SUPPLIERS

7.6
weeks

Average delay to ship due to

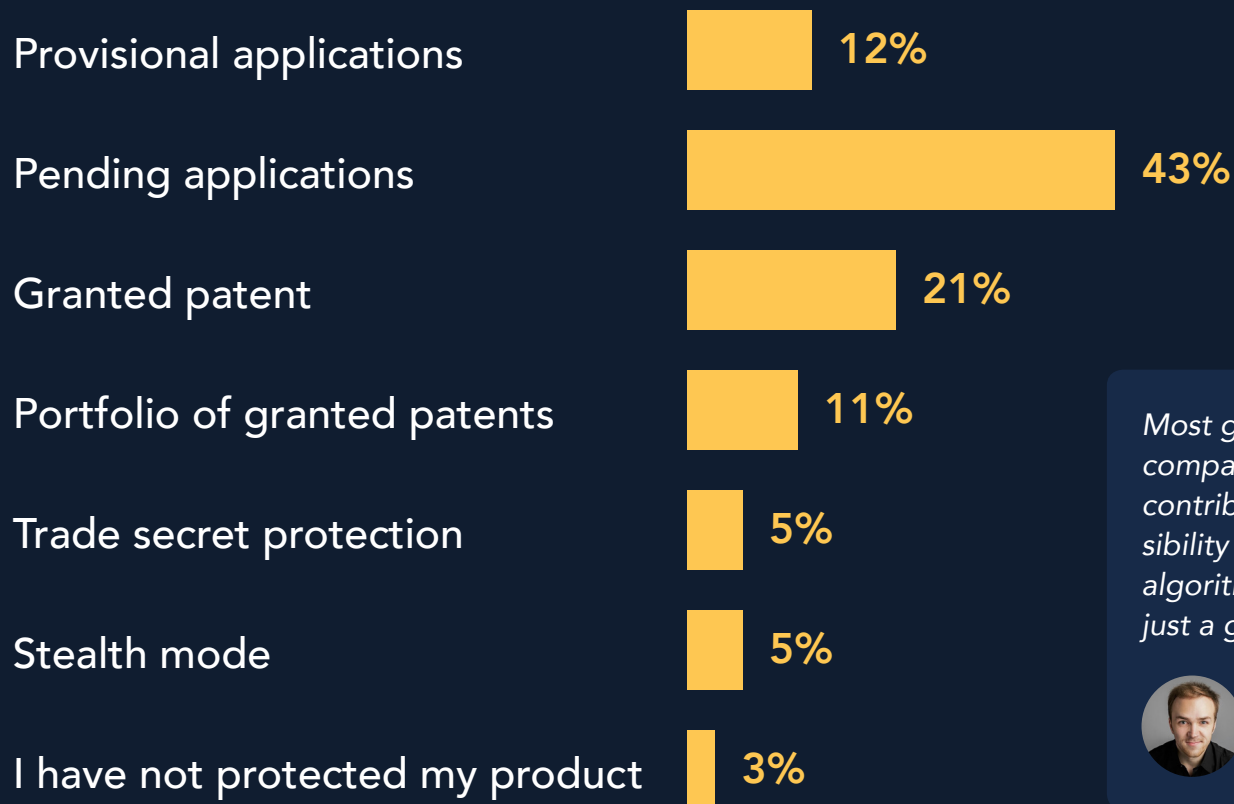
THE MANUFACTURER

8.0
weeks

Most companies (86%) protect their technology through patents

14% of the respondents have not protected their innovation yet or not planning to do so in the near future ("trade secret protection", "stealth mode", "I have not protected my product").

DISTRIBUTION OF RESPONDENTS BY IP PROTECTION STATUS



”
Most great hardware companies are really software companies in disguise. And so while patents are a nice contributing factor in creating a moat, the real defensibility still should come from software, e.g. via your algorithms, the network effects of your ecosystem or just a great & deeply integrated product experience.



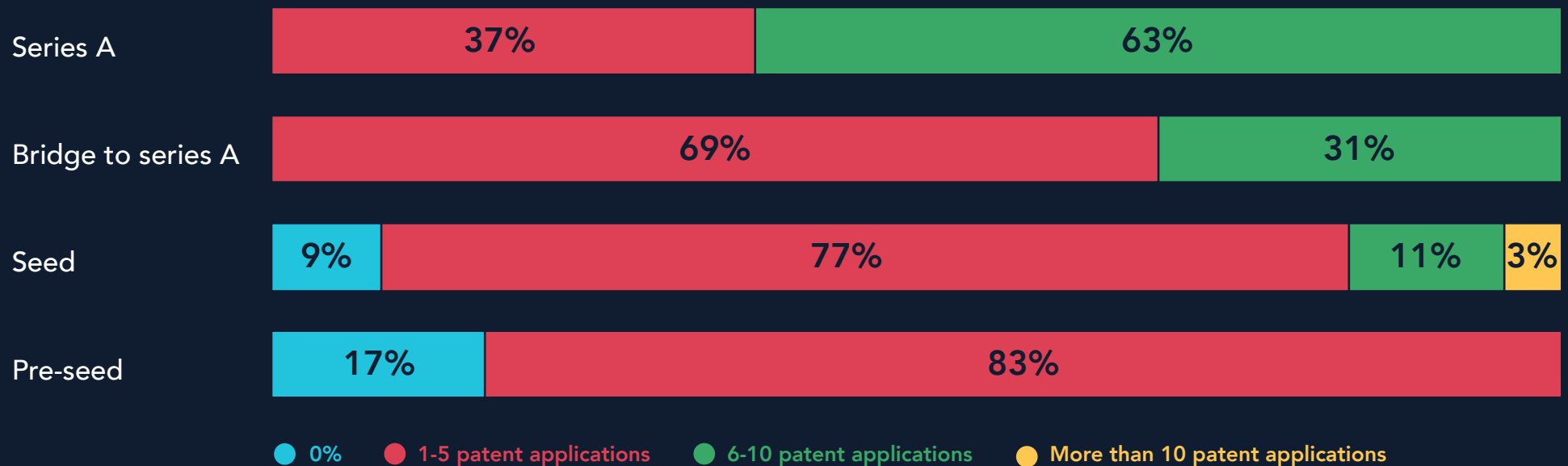
Florian Simmendinger

Founder & CEO - Soundbrenner

Startups tend to fill more patent applications post Series A funding

Pre-series A startups have mostly filled between 1 and 5 patent applications while 63% of the series A startups have filled between 6 and 10 of them.

DISTRIBUTION OF NUMBER OF PATENT APPLICATIONS BY LAST FUNDING ROUND

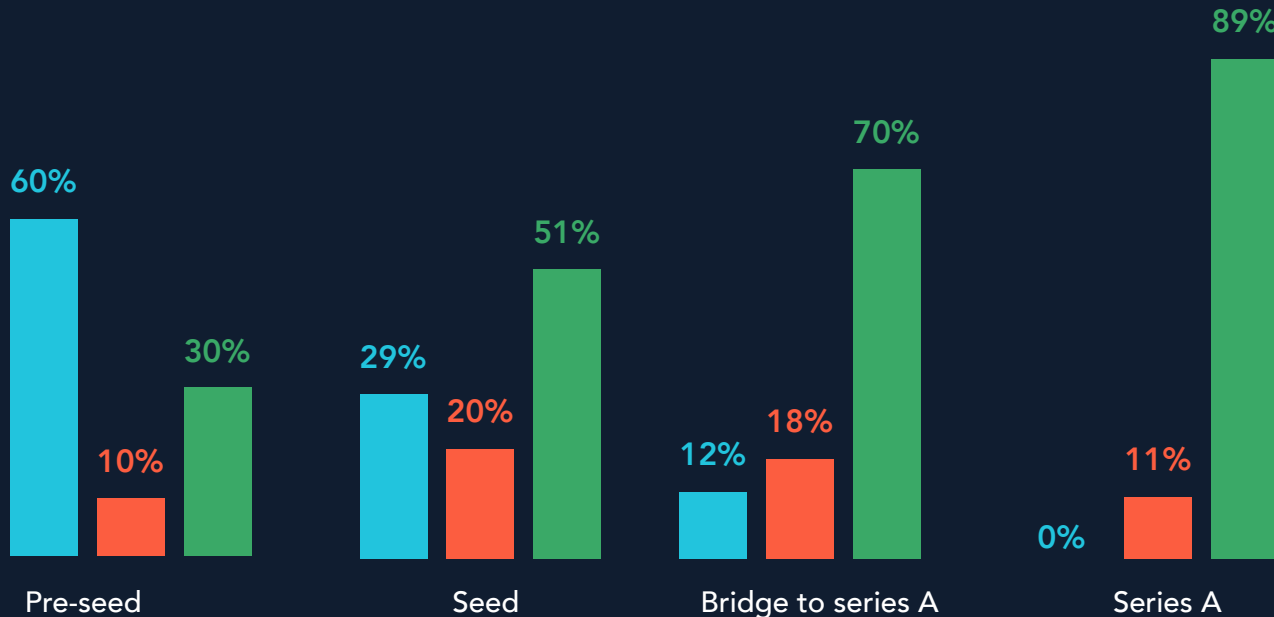


Half (51%) of the seed stage companies are shipping

12% of the companies whose last funding round was a bridge are still not shipping.

DISTRIBUTION OF SHIPPING STATUS BY LAST FUNDING ROUND

- No, we haven't started anything related to shipping
- More or less, we are working on shipping our first batch (sourcing shipping partners, etc.)
- Yes, we are currently shipping / we have already shipped



”
What is exciting about the future of hardware is the possibility to prototype, polish and ship without big capital investments thanks to good quality off-the-shelf components and rapid prototyping.



Felipe Chávez
Cofounder & CEO
Kiwi Campus

04 MARKETING & SALES

- Marketing budgets remain small no matter the funding stage 25
- Search and social advertising are the biggest allocation of the marketing budget 26
- Google organic is the top source of website traffic 27
- Google organic is the most performant channel when it comes to generating sales or leads 28
- Predicting sales is a tough challenge for companies, whether they're a B2C or B2B business 29
- Series A startups can still be at a pre-launch or pre-commercialisation stage 30

Marketing budgets remain small no matter the funding stage

The marketing budget grows in small increments from pre-seed to series A, the average series A marketing budget being only x1.5 the average marketing budget of seed stage respondents.

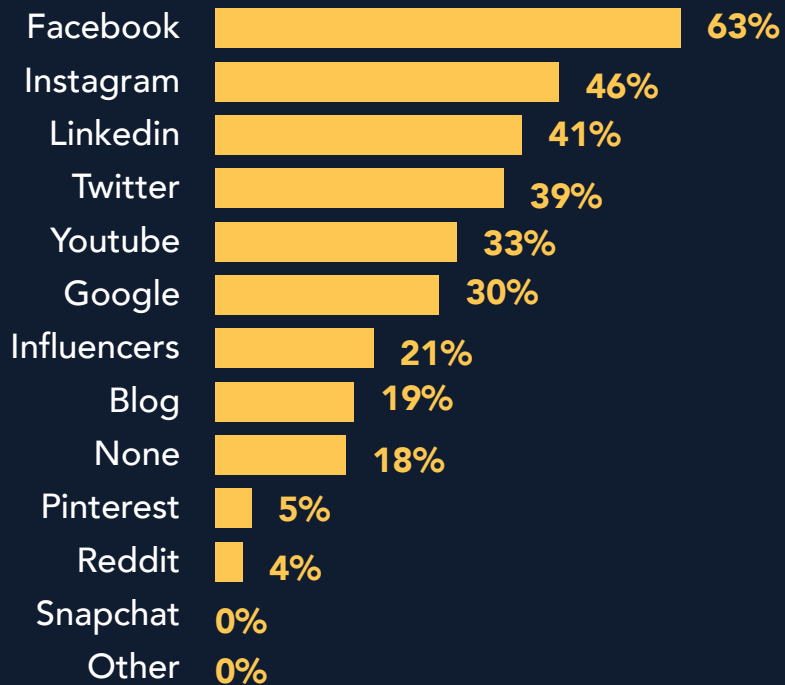
AVERAGE MARKETING BUDGET BY LAST FUNDING ROUND



Search and social advertising are the biggest allocation of the marketing budget

Pinterest and Reddit remain pretty untapped compared to Facebook and Instagram when it comes to promoting the company or product over digital channels.

WHICH DIGITAL CHANNELS ARE YOU ACTIVELY USING TO PROMOTE YOUR COMPANY / PRODUCT?



Top 3 marketing channels respondents are mostly spending their marketing budget on:

#1 Search and social advertising

#2 Website

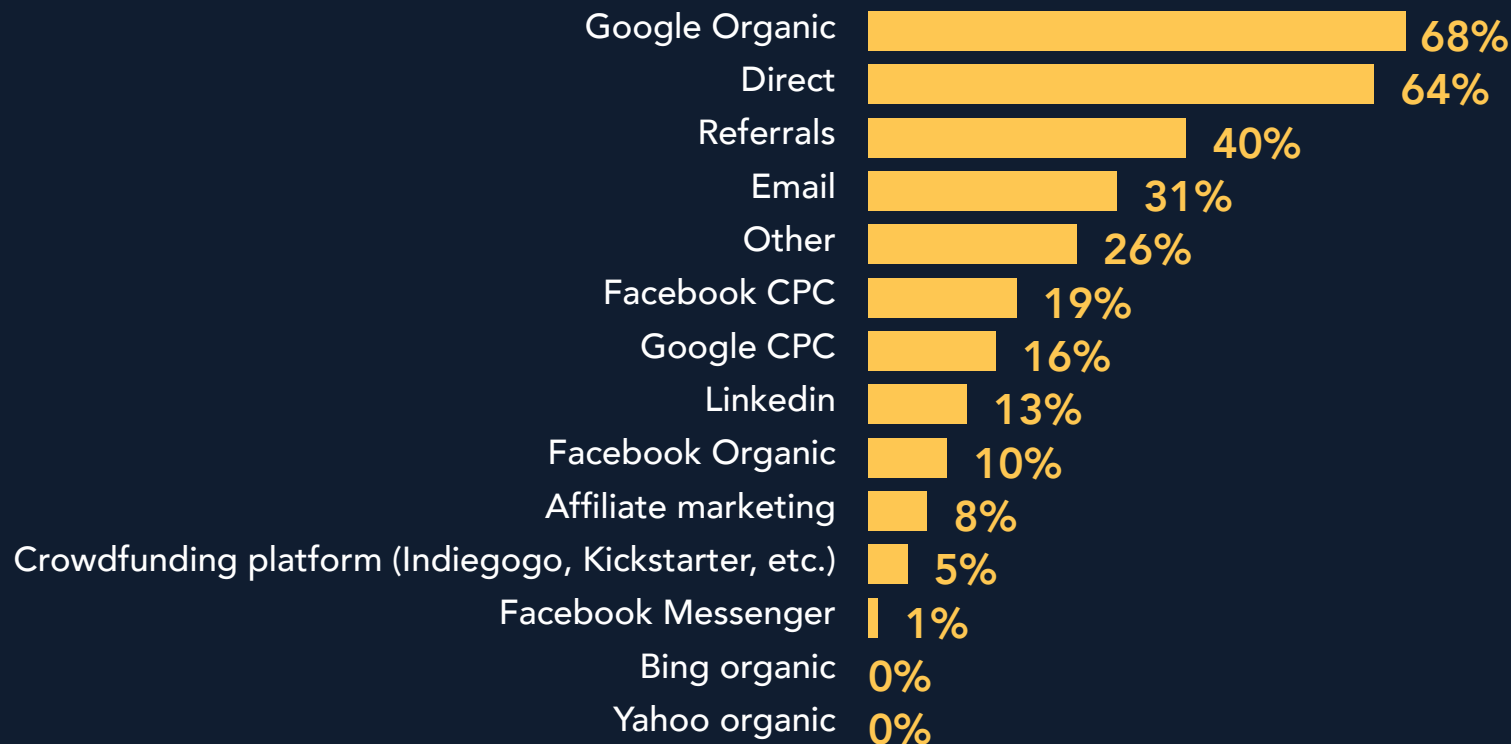
#3 PR

N.B.: Companies could pick as many options as they wanted among the list.

Google organic is the top source of website traffic

Investing in SEO over Facebook CPC (only ranks #6) seems like a better suited strategy when it comes to growing the website traffic.

WHAT ARE THE TOP 3 SOURCES THAT GENERATE MOST OF YOUR WEBSITE TRAFFIC?

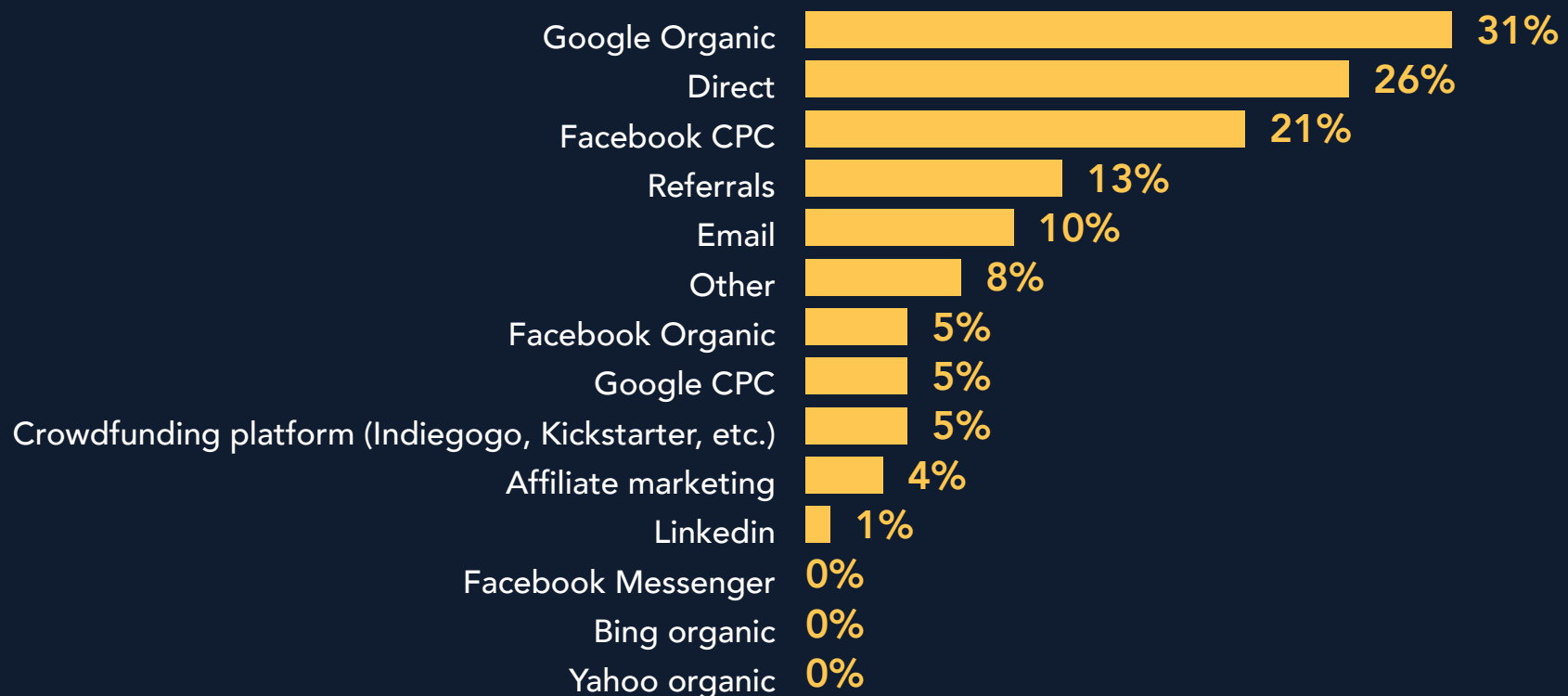


N.B.: Companies could pick three options among the list.

Google organic is the most performant channel when it comes to generating sales or leads

Email only got 10% of the votes.

WHAT ARE THE TOP 3 SOURCES THAT GENERATE MOST OF YOUR WEBSITE PRE-SALES / SALES / LEADS?



| **N.B.:** Companies could pick three options among the list.

Predicting sales is a tough challenge for companies, whether they're a B2C or B2B business

What is your biggest challenge regarding sales?

#1 Predicting sales

#2 Hiring sales people

#3 Setting sales numbers

#4 Other

#5 Monitoring sales efficiency

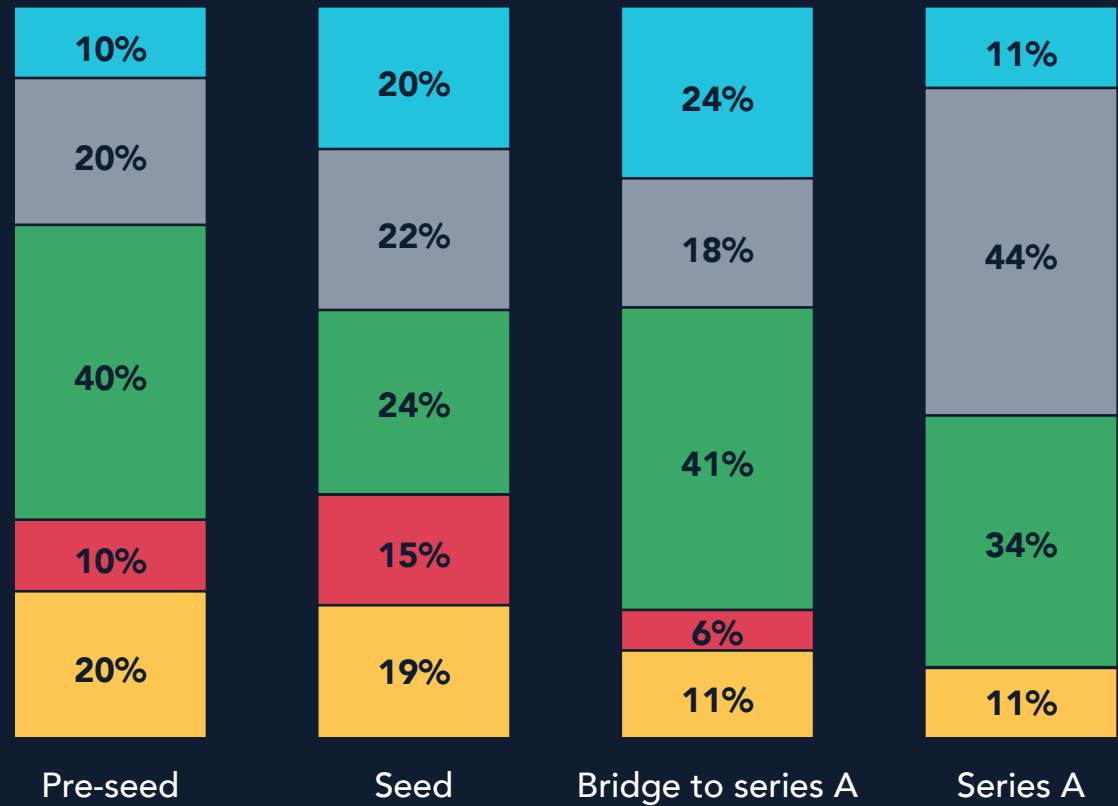
N.B.: "Other" includes: identifying champions & big projects, fulfilling demand, having sufficient production units to cover demand, market adoption, not enough time, hiring technical people with the right hardware experience, customer inertia, long sales cycles, understanding what distributors want/need.

Series A startups can still be at a pre-launch or pre-commercialisation stage

11% of the series A respondents haven't shipped yet, which is half the number for seed respondents (20%).

DISTRIBUTION OF SALES STATUS BY LAST FUNDING ROUND

- Pre-launch / Pre-commercialisation
- Pre-orders / LOI
- Shipping / Pilot
- Retail / Deploying
- Scaling / Growth



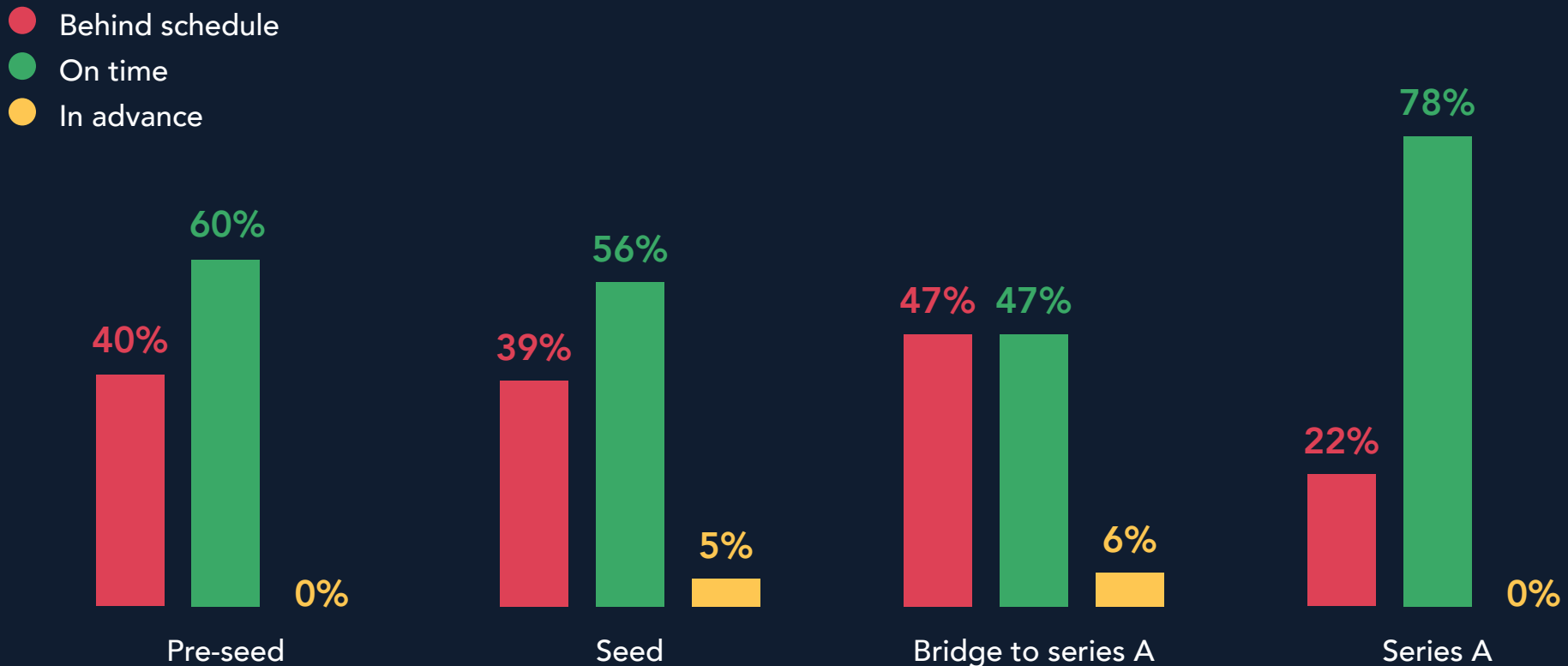
05 TEAM & HIRING

— Most companies are aligned with their hiring plan timeline	32
— Hardware engineering positions are the hardest roles to fill across all departments	33
— Founders find new hires mostly through active outreach	34
— Founders own on average 34% in equity after the series A	35
— The option pool remains on average around 10% regardless of the funding stage	36
— Overall, the equity allocated to top management positions matches Silicon Valley's standards	37
— Finding the right talents might be founders' biggest challenge but making the right hire comes actually right after	38
— Having remote teams and multiple offices aren't the norm yet but are pretty common practices	39
— Most pre-series A founders wear the CFO hat	40
— A pair of cofounders is the most common profile of founding teams	41

Most companies are aligned with their hiring plan timeline

22% among the series A respondents are late on their hiring plan, which is x2.1 less than the companies at the bridge to series A stage.

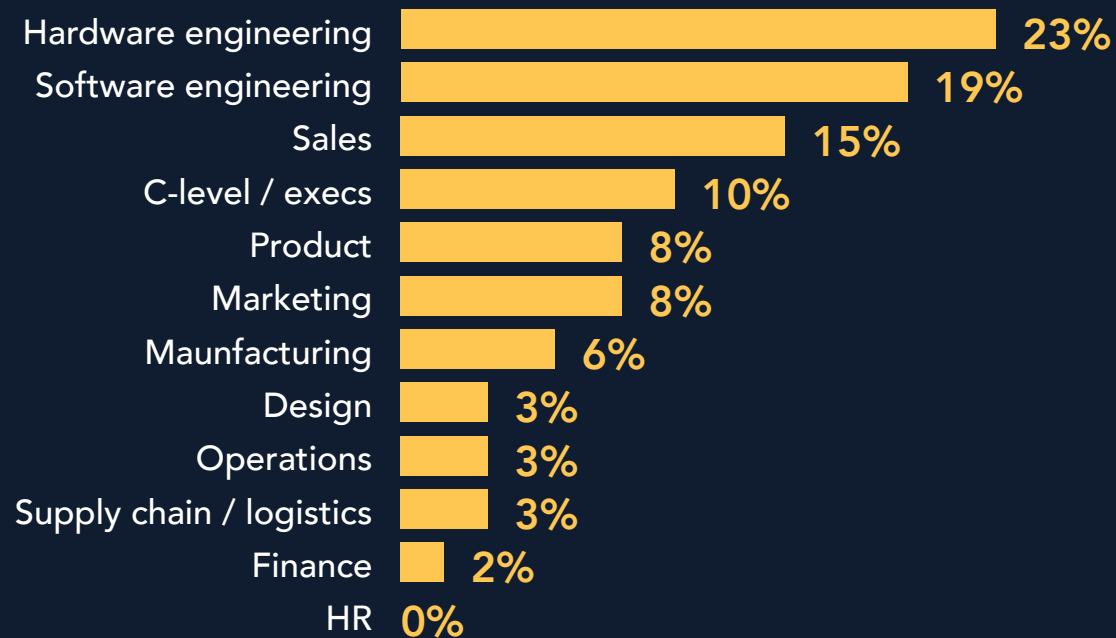
DISTRIBUTION OF HIRING PLAN STATUS BY LAST FUNDING ROUND



Hardware engineering positions are the hardest roles to fill across all departments

Software engineering is the second most challenging role (19%) to fill according to respondents.

WHAT ARE THE 3 MOST DIFFICULT ROLES TO HIRE?

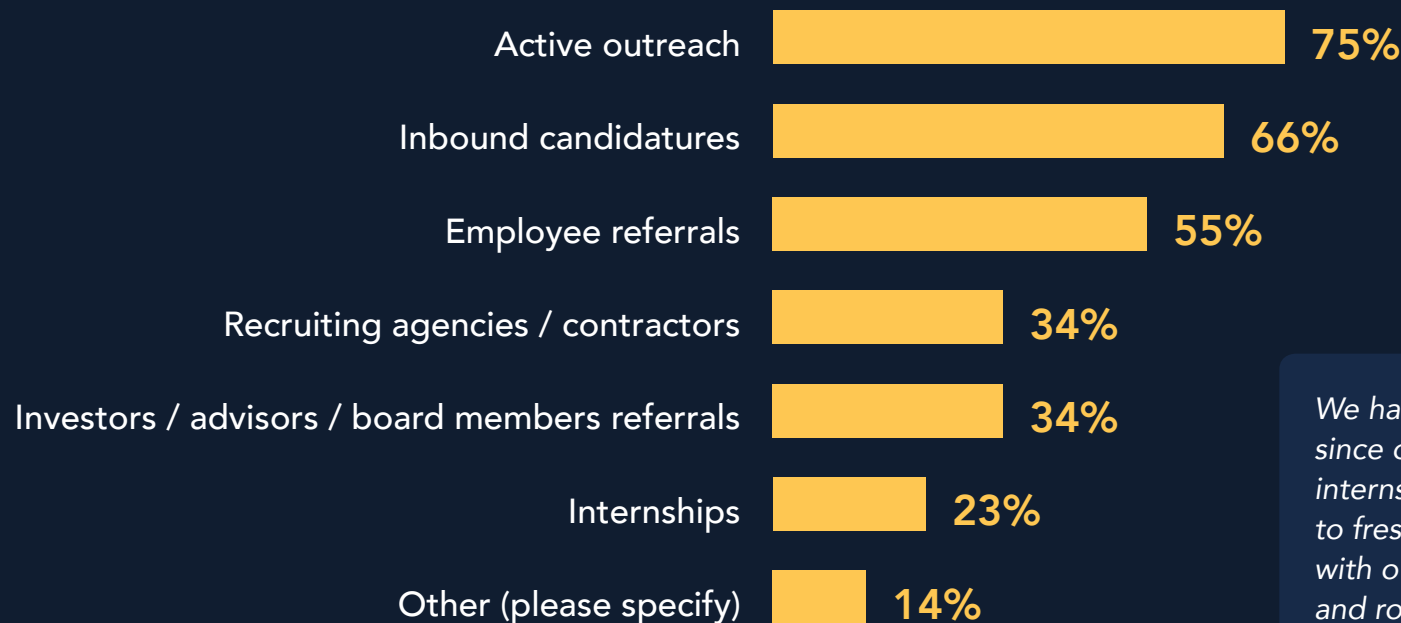


| **N.B.:** Companies could pick up to 3 answers among the listed roles

Founders find new hires mostly through active outreach

Inbound candidatures are also a very performant pipeline and ranks second before employee referrals and profesional recruiters.

WHAT ARE YOUR TOP 3 PIPELINES FOR HIRING?



”
We have been doubling in size every year since our founding. By offering an array of internships, we have an unfair advantage to fresh talent that is eager to get to work with our team of engineers, developers and roboticists to make the impossible possible at A&K.



Matthew Anderson

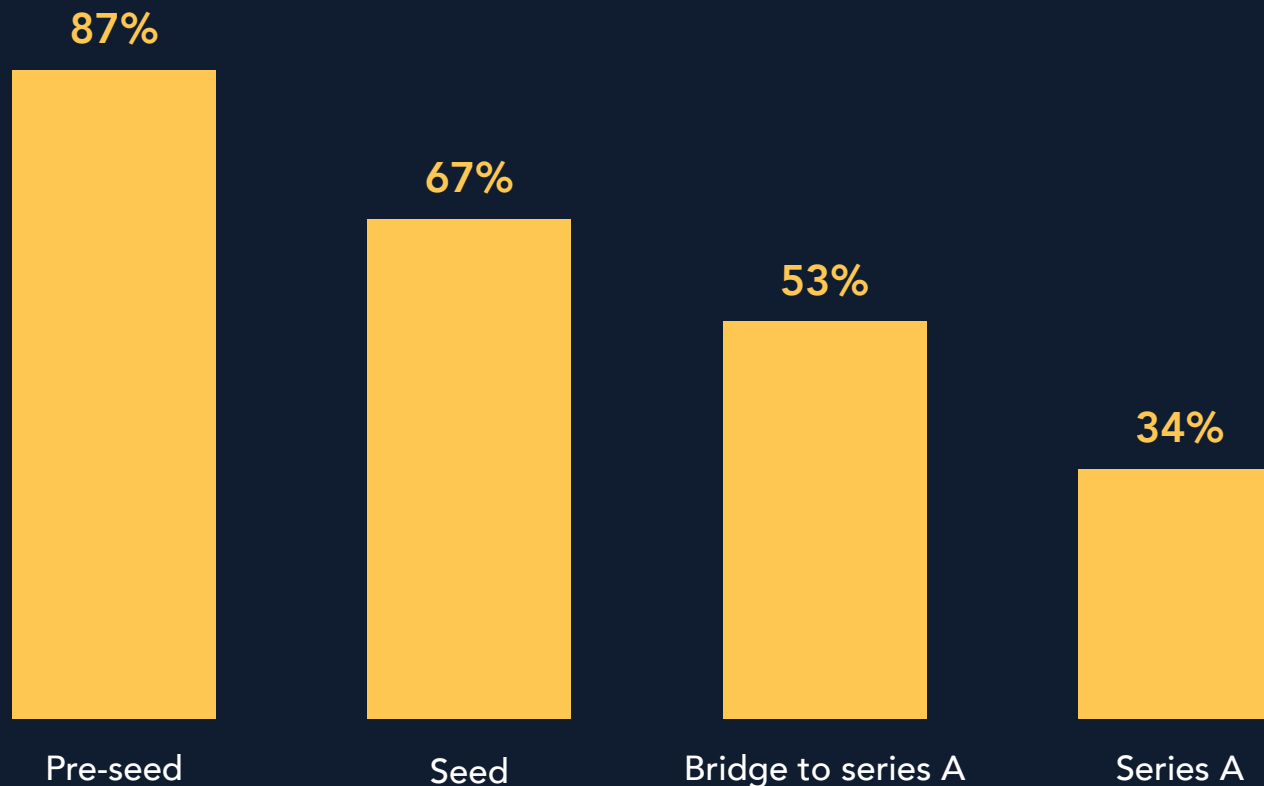
Cofounder & CEO - A&K Robotics

N.B.: Companies could pick up to 3 answers among the listed roles

Founders own on average 34% of the equity after the series A

Series A founders own x2 less equity than seed founders (67%).

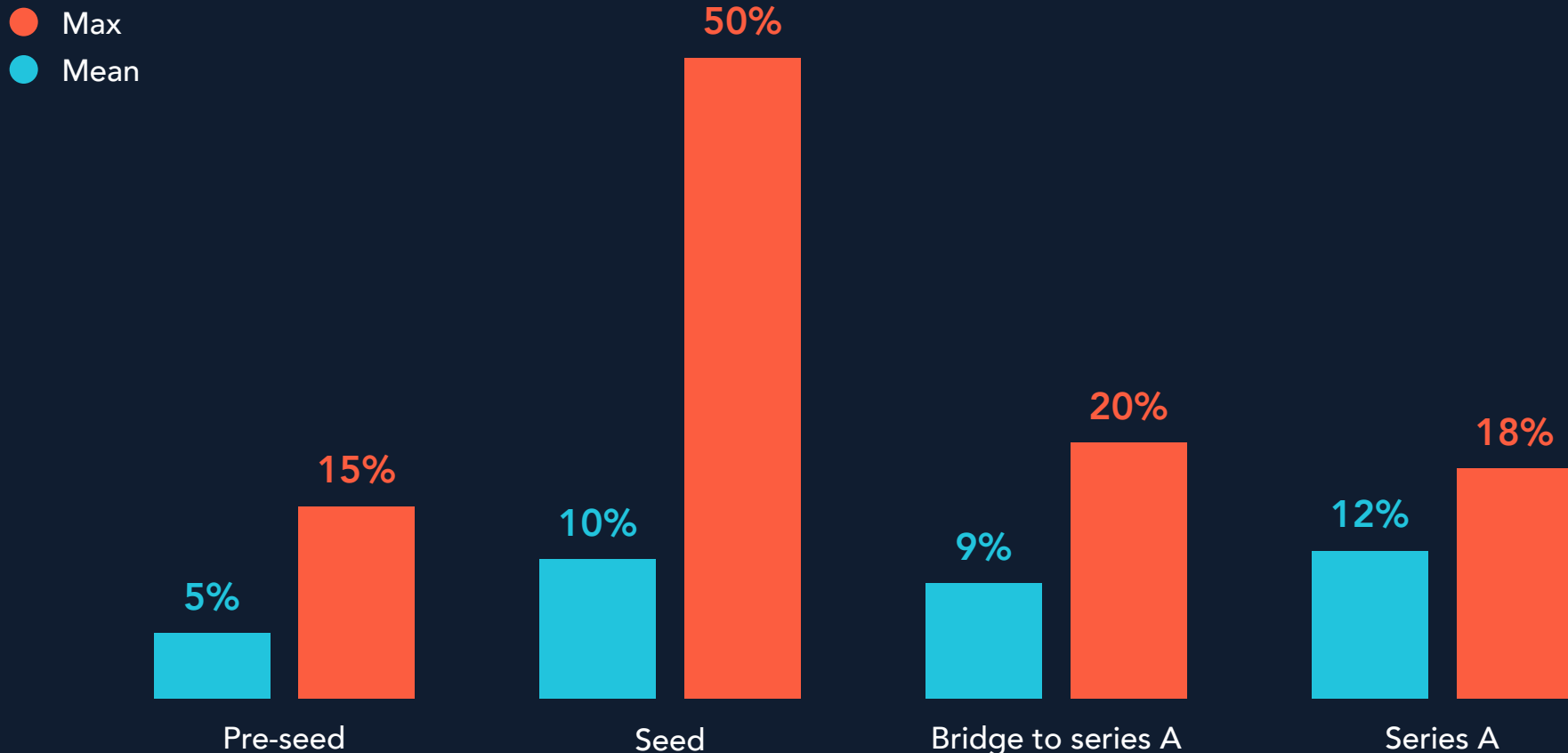
AVERAGE % OF EQUITY OWNED BY FOUNDERS BY LAST FUNDING ROUND



The option pool remains on average around 10% regardless of the funding stage

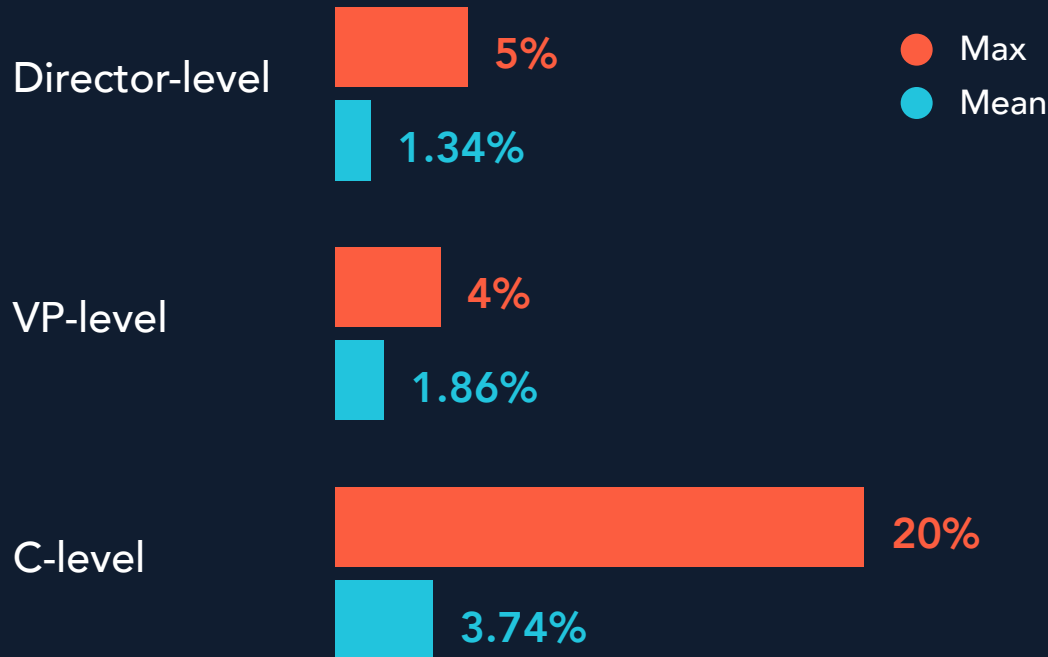
Series A respondents have the biggest option pool with 12% on average.

AVERAGE AND MAXIMUM SIZE OF OPTION POOL BY LAST FUNDING ROUND



Overall, the equity allocated to top management positions matches Silicon Valley's standards

AVERAGE EQUITY GRANTED BY SENIORITY LEVEL



STANDARD VALUES FOR ALLOCATING EQUITY

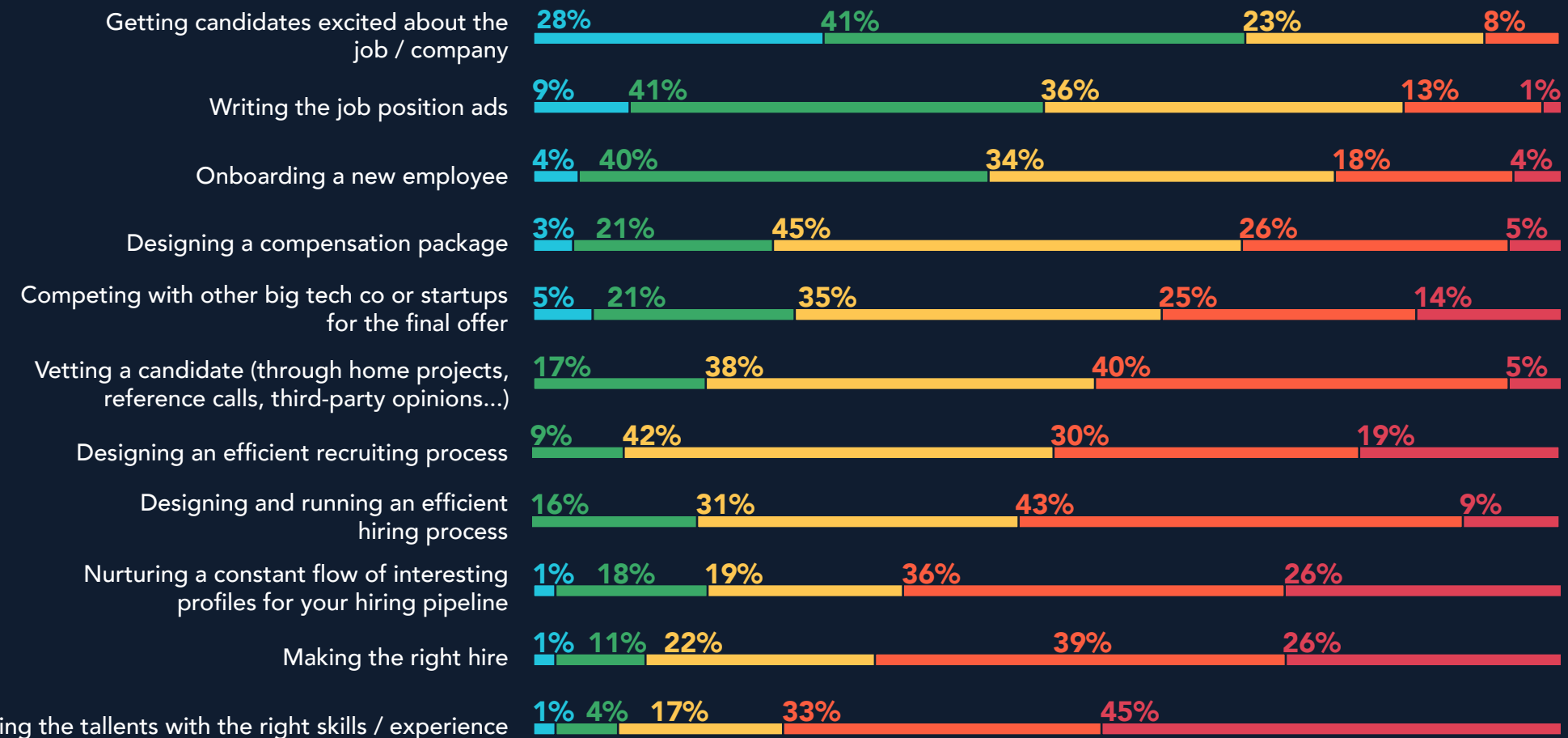
TITLE	RANGE (%)
CEO	5 - 10
COO	2 - 5
VP	1 - 2
Independent board member	0.4 - 1.25
Director	0.5 - 1
Lead engineer	0.5 - 1
5+ years experience engineer	0.33 - 0.66
Manager or junior engineer	0.2 - 0.33

| **N.B.:** Data according to Venture Hacks (source: <https://venturehacks.com/articles/option-pool-shuffle#market>)

Finding the right talents might be founders' biggest challenge but making the right hire comes actually right after

Designing and running an efficient hiring process is the 4th biggest challenge met by respondents. Competition with other big tech companies or startups is very difficult for only 14% of the companies.

HOW DIFFICULT OR EASY WERE THESE ASPECTS OF THE HIRING PROCESS?



● Very easy ● Somewhat easy ● Neither difficult nor easy ● Somewhat difficult ● Very difficult

Remote teams and multiple offices aren't the norm yet but are pretty common practices

A third of the respondents have more than one office and a third of them are working across multiple countries.

How many offices do you have?

1 office: **70%**

2 offices: **25%**

3 offices: **5%**

54% of the respondents have **0 FTEs** working remote

24% of the respondents have **15% or more of their FTEs** working remote

On how many countries is your team split?

1 country: **64%**

2 countries: **29%**

3 countries: **7%**

” Europe and the Bay Area remain dominant centers of tech concentration, but teams are becoming more distributed as well. Arch Systems is headquartered in the Silicon Valley Bay Area, but will soon have around half of our team working distributed in other regions as we serve global manufacturing customers with machine data and analytics.



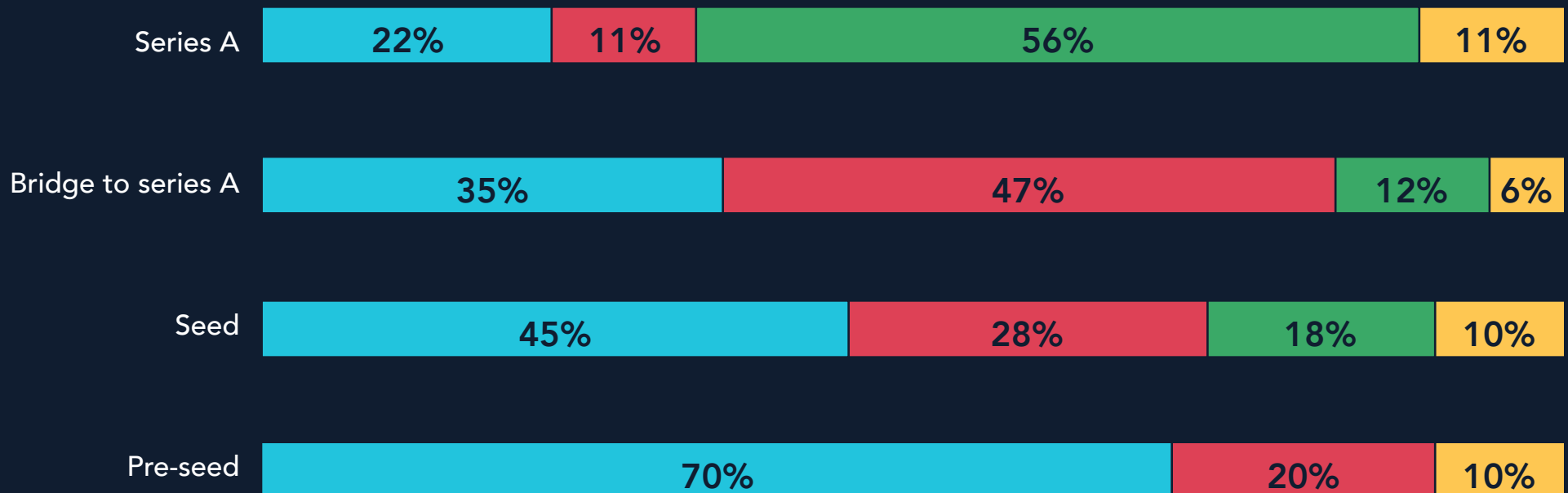
Andrew Scheuermann

CEO - Arch Systems

Most pre-series A founders wear the CFO hat

DO YOU HAVE AN IN-HOUSE CFO?

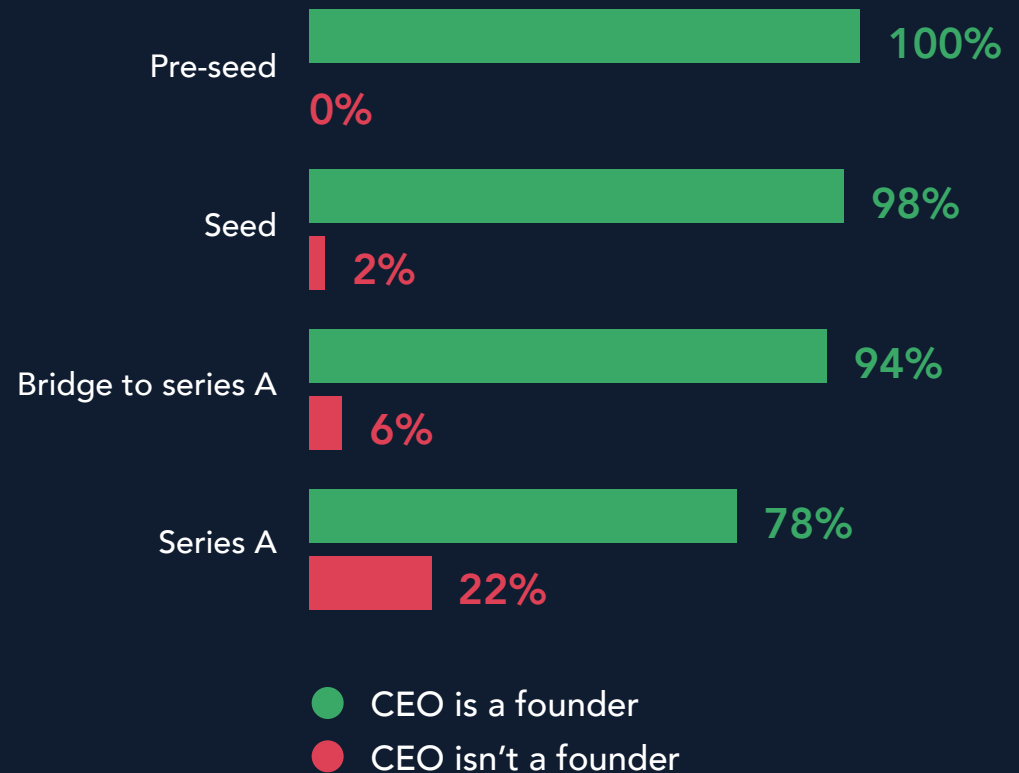
- No, I'm taking care of our financials & accounting
- No, I'm doing some and outsourcing some functions
- Yes, we have a dedicated CFO
- No, I'm outsourcing financials & accounting



A pair of cofounders is the most common profile of founding teams

22% of the series A CEOs aren't a founder of the company, which is x2.4 more than CEOs at the bridge to series A stage.

CEO'S FOUNDER STATUS BY LAST FUNDING ROUND



How many cofounders does the company have?

2 cofounders: **41%**

3 cofounders: **26%**

1 cofounder: **16%**

4 cofounders: **10%**

5 cofounders: **7%**

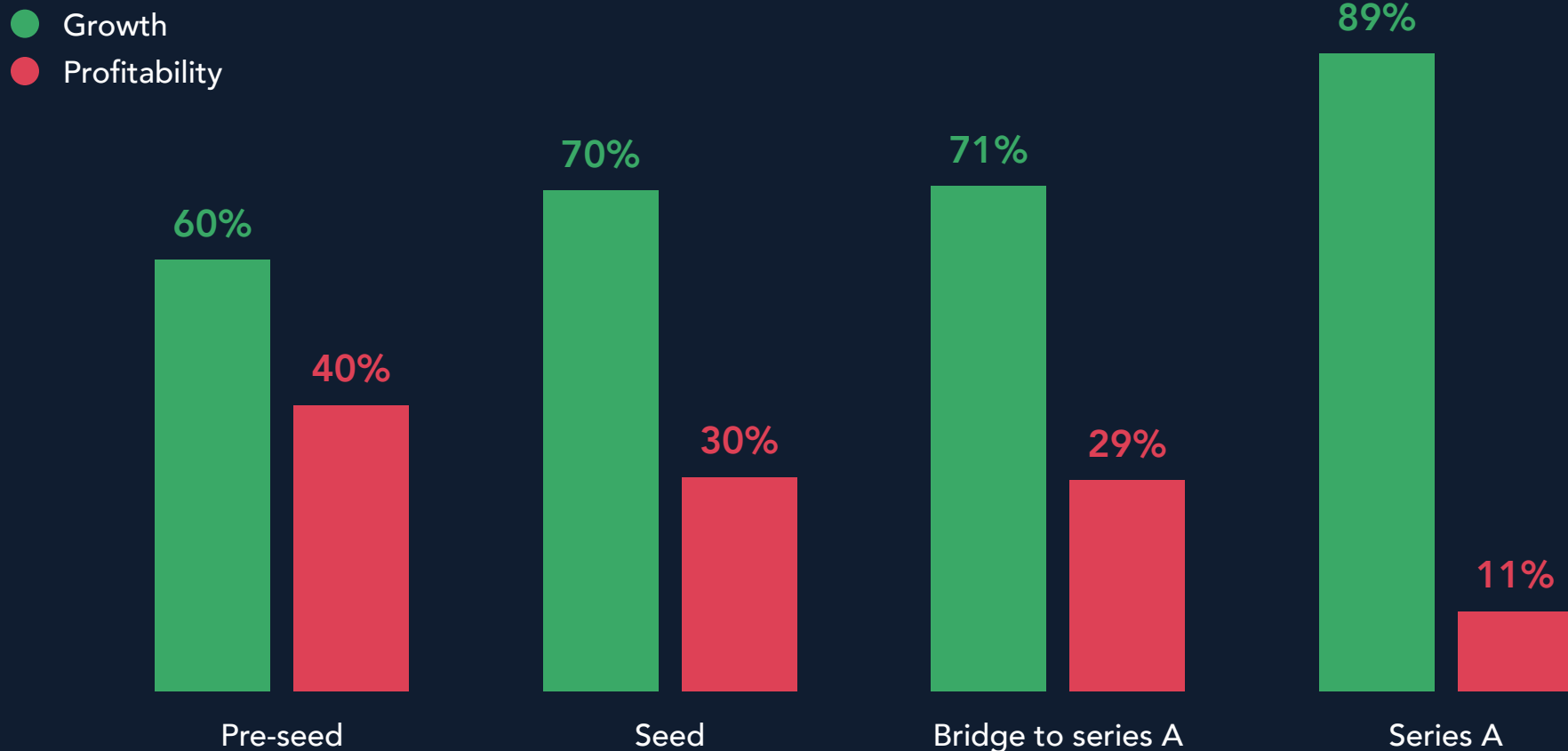
06 FINANCIALS

- Companies majoritarilly optimize for growth over profitability 43
- Companies forecast to be profitable within a 18-month window, no matter the funding stage 44

Companies majoritarily optimize for growth over profitability

40% of the pre-seed respondents are optimizing for profitability, which is x3.6 more than the series A respondents.

GROWTH OR PROFITABILITY GOAL BY LAST FUNDING ROUND

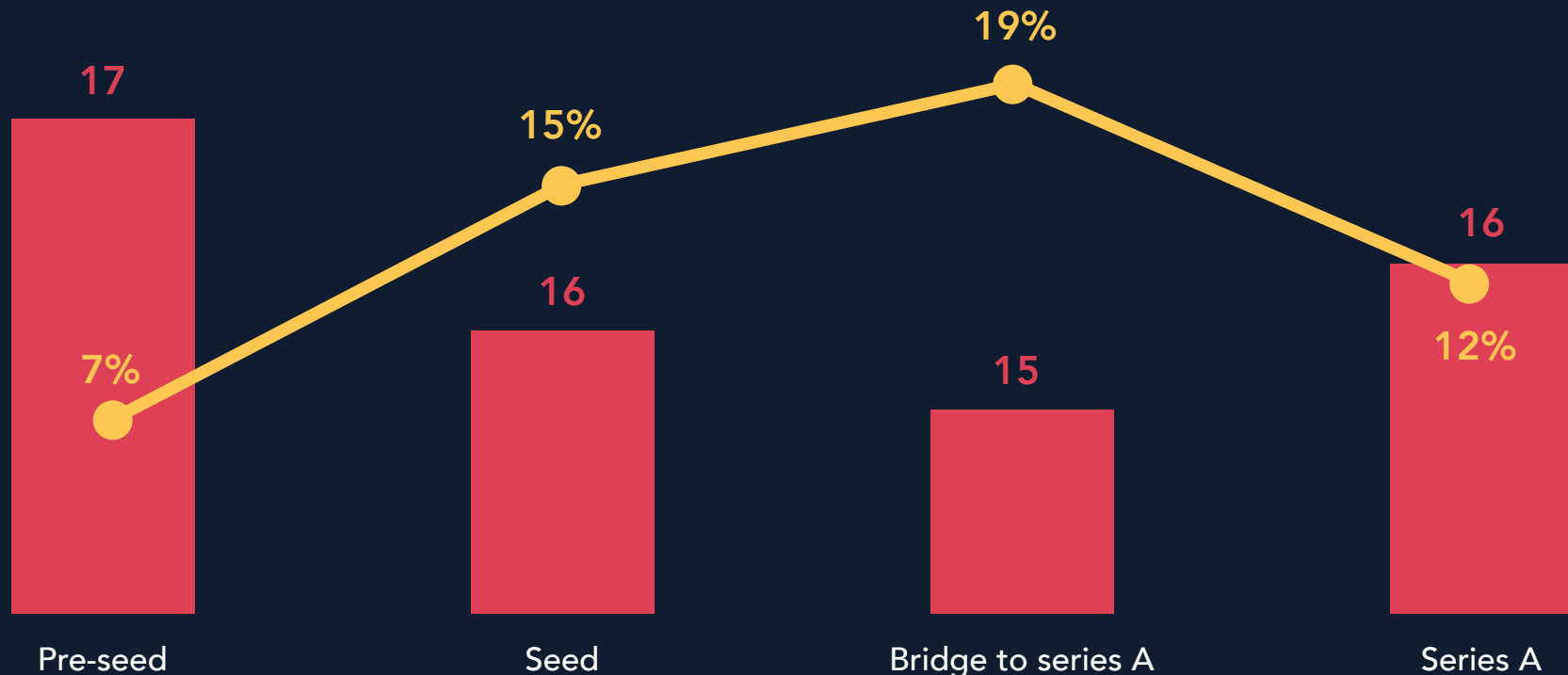


Companies forecast to be profitable within a 18-month window, no matter the funding stage

Respondents who raised a bridge to series A round have the highest MoM (Month-over-Month) growth and the shortest expected path to profitability.

AVERAGE MoM GROWTH AND PROFITABILITY TIMELINE BY LAST FUNDING ROUND

- Average MoM (Month-over-Month) growth so far in 2018
- Average number of months before reaching profitability



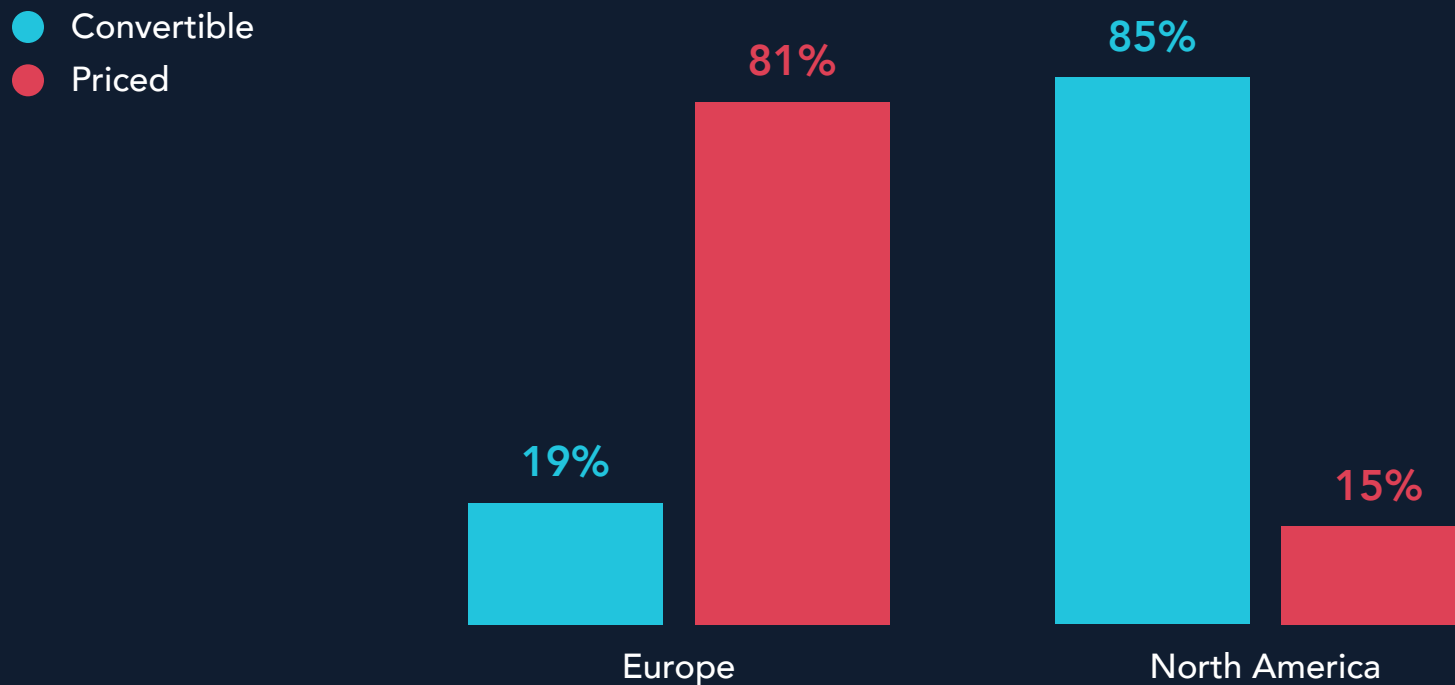
07 FUNDING

— For pre-seed rounds, European startups massively prefer priced round to convertible notes unlike North American startups	46
— At pre-seed, North American startups raised x1.4 the amount raised by European startups	47
— 43% of North American respondents picked a priced round for their seed funding versus 15% at pre-seed	48
— The seed rounds of North American respondents are x1.9 higher than Europeans' both in terms of capital raised and valuation / cap	49
— Convertible notes are the preferred way to raise a bridge to series A round among North American respondents	50
— Bridge rounds are x2.7 bigger for respondents based in North America compared to respondents in Europe	51
— Finding who invests in hardware / who could be a good fit is founders' biggest challenges regarding fundraising	52
— A majority of European respondents (69%) have benefited from grants	53
— Angels are the most represented class of investors across early-stage funding rounds	54
— A third of the founders consider their investors to be very involved, no matter the funding stage	55
— When it comes to their exit strategy, hardware companies majoritarilly target acquisitions over IPOs	56
— Founders are optimistic regarding the M&A market for hardware startups	57

For pre-seed rounds, European startups massively prefer priced round to convertible notes unlike North American startups

85% of the companies based in North America choose convertible notes for their seed round, which is x4.5 more than respondents based in Europe.

DISTRIBUTION OF TYPES OF ROUND BY GEOGRAPHICAL AREA FOR PRE-SEED ROUNDS



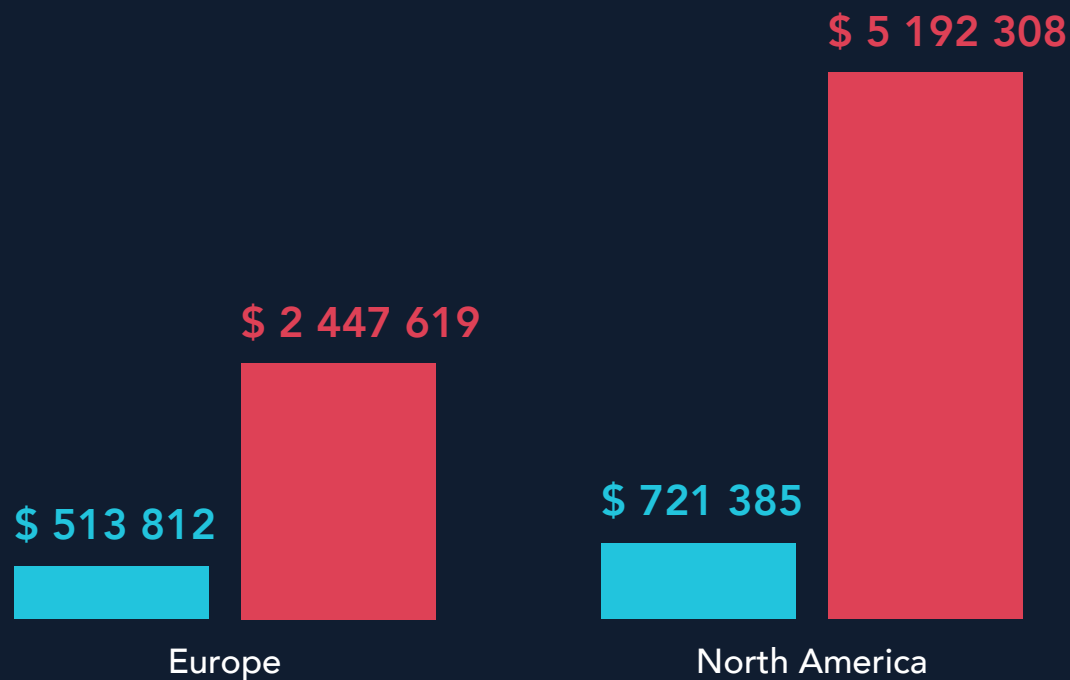
| **N.B.:** Due to the limited number of answers obtained for other regions we decided to not feature Asia, South America and Australia.

At pre-seed, North American startups raised x1.4 the amount raised by European startups

The average valuation / cap of North American respondents is x2.1 higher than their European counterparts.

AVERAGE AMOUNT RAISED AND VALUATION / CAP BY GEOGRAPHICAL AREA FOR PRE-SEED ROUNDS

- Average amount raised
- Average valuation/cap

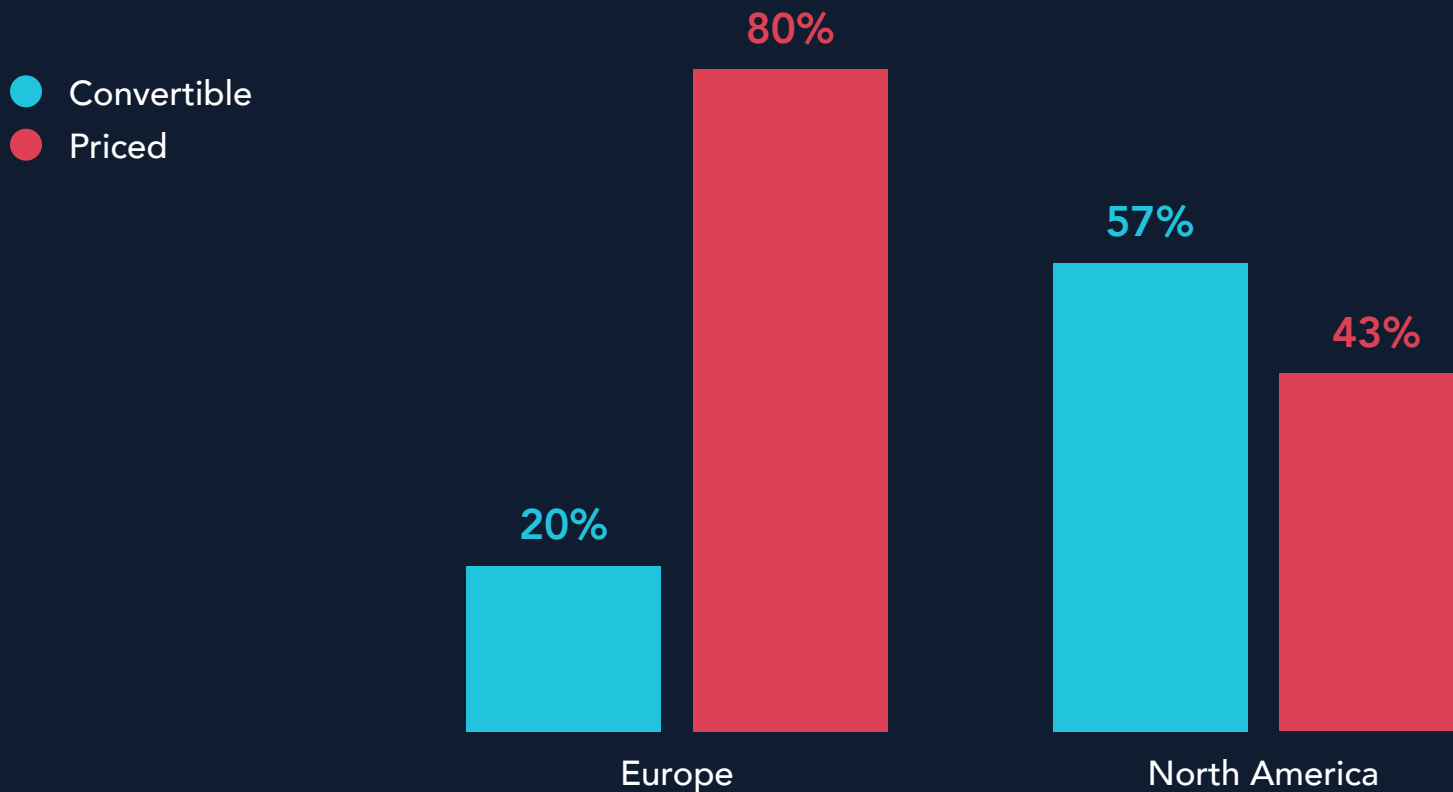


| **N.B.:** Due to the limited number of answers obtained for other regions we decided to not feature Asia, South America and Australia.

43% of North American respondents picked a priced round for their seed funding versus 15% at pre-seed

For European respondents, the distribution between convertible and priced rounds at seed stage (respectively 20% and 80%) is the same as at pre-seed stage (cf. previous slide).

DISTRIBUTION OF TYPES OF ROUND BY GEOGRAPHICAL AREA FOR SEED ROUNDS

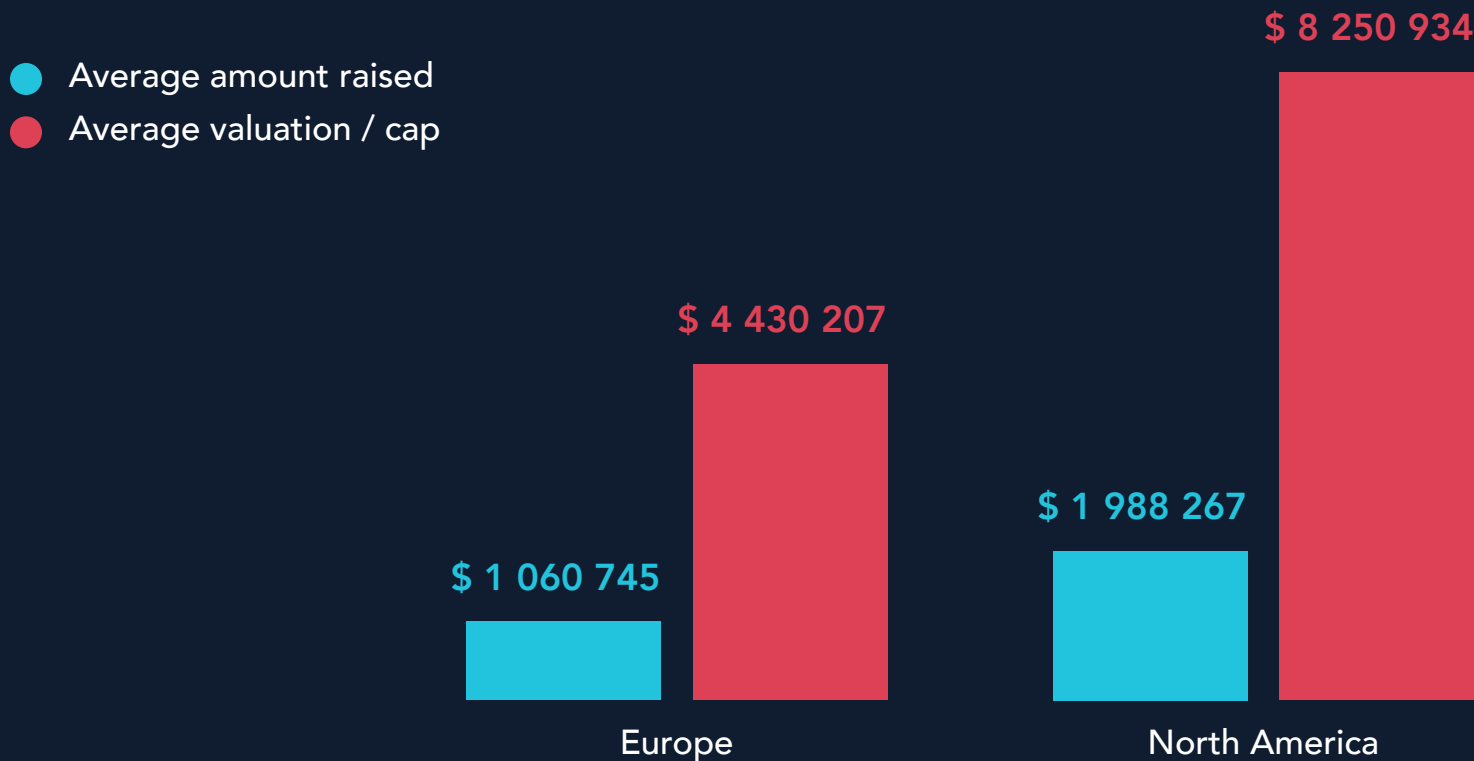


| **N.B.:** Due to the limited number of answers obtained for other regions we decided to not feature Asia, South America and Australia.

The seed rounds of North American respondents are x1.9 higher than Europeans' both in terms of capital raised and valuation / cap

The average amount raised by respondents at seed stage fluctuates between \$1M and \$2M across Europe and North America.

AVERAGE AMOUNT RAISED AND VALUATION / CAP BY GEOGRAPHICAL AREA FOR SEED ROUNDS

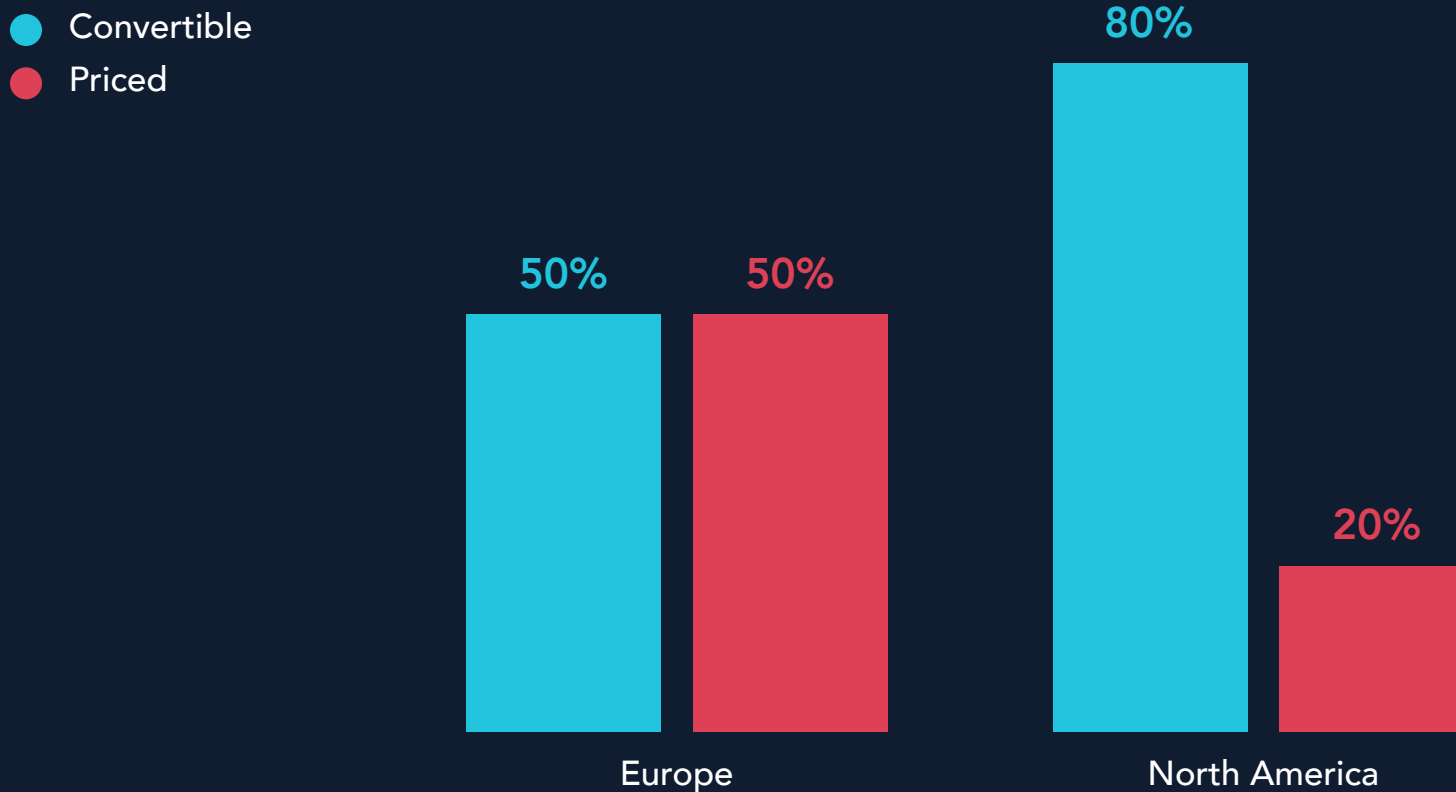


N.B.: Due to the limited number of answers obtained for other regions we decided to not feature Asia, South America and Australia.

Convertible notes are the preferred way to raise a bridge to series A round among North American respondents

For respondents based in Europe, priced round were as popular as convertible notes to raise a bridge to series A round.

DISTRIBUTION OF TYPES OF ROUND BY GEOGRAPHICAL AREA FOR BRIDGE TO SERIES A ROUNDS

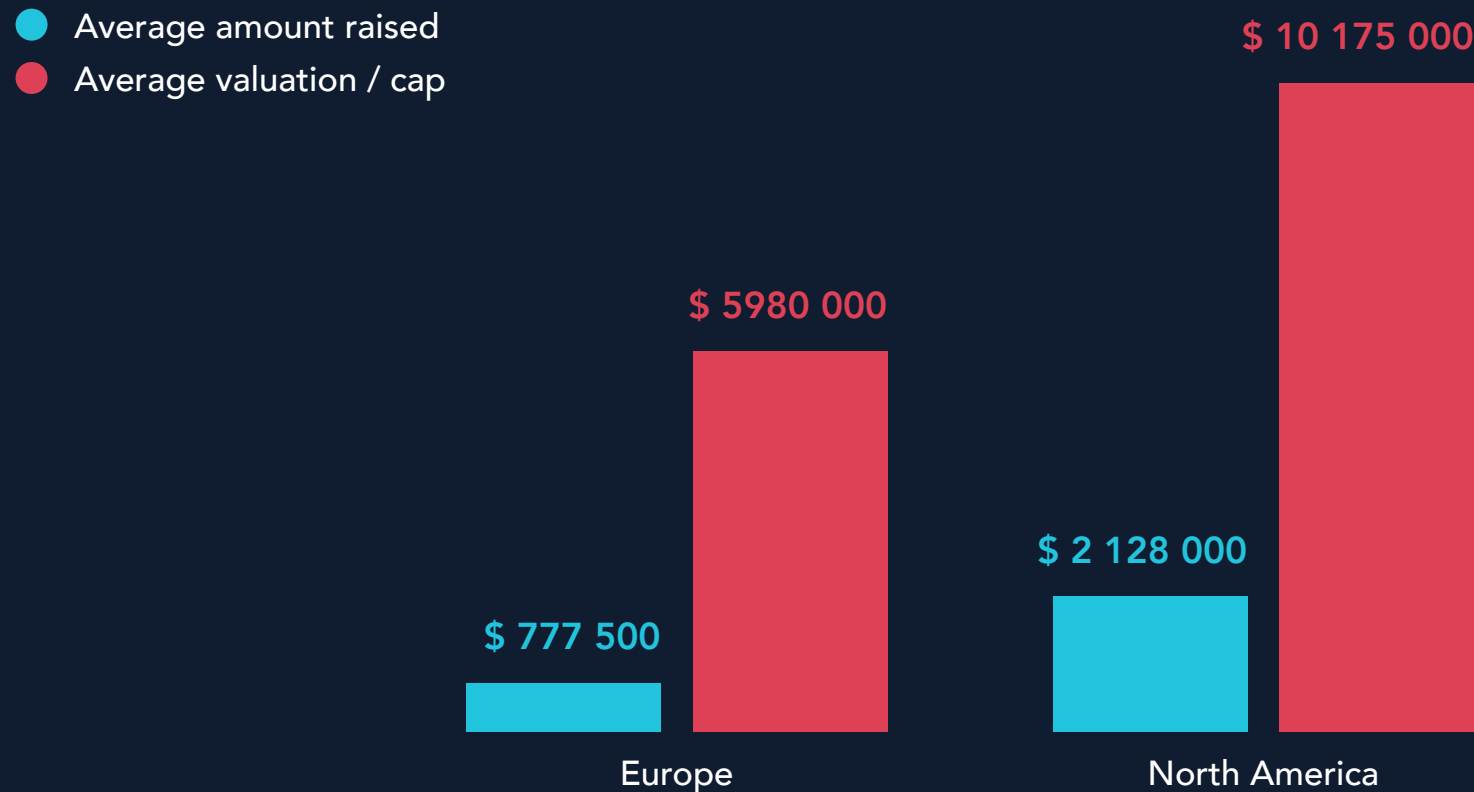


| **N.B.:** Due to the limited number of answers obtained for other regions we decided to not feature Asia, South America and Australia.

Bridge rounds are x2.7 bigger for respondents based in North America compared to respondents in Europe

The average valuation of North American startups is x1.7 higher than the European startups' for bridge to series A rounds.

AVERAGE AMOUNT RAISED AND VALUATION / CAP BY GEOGRAPHICAL AREA FOR BRIDGE TO SERIES A ROUNDS

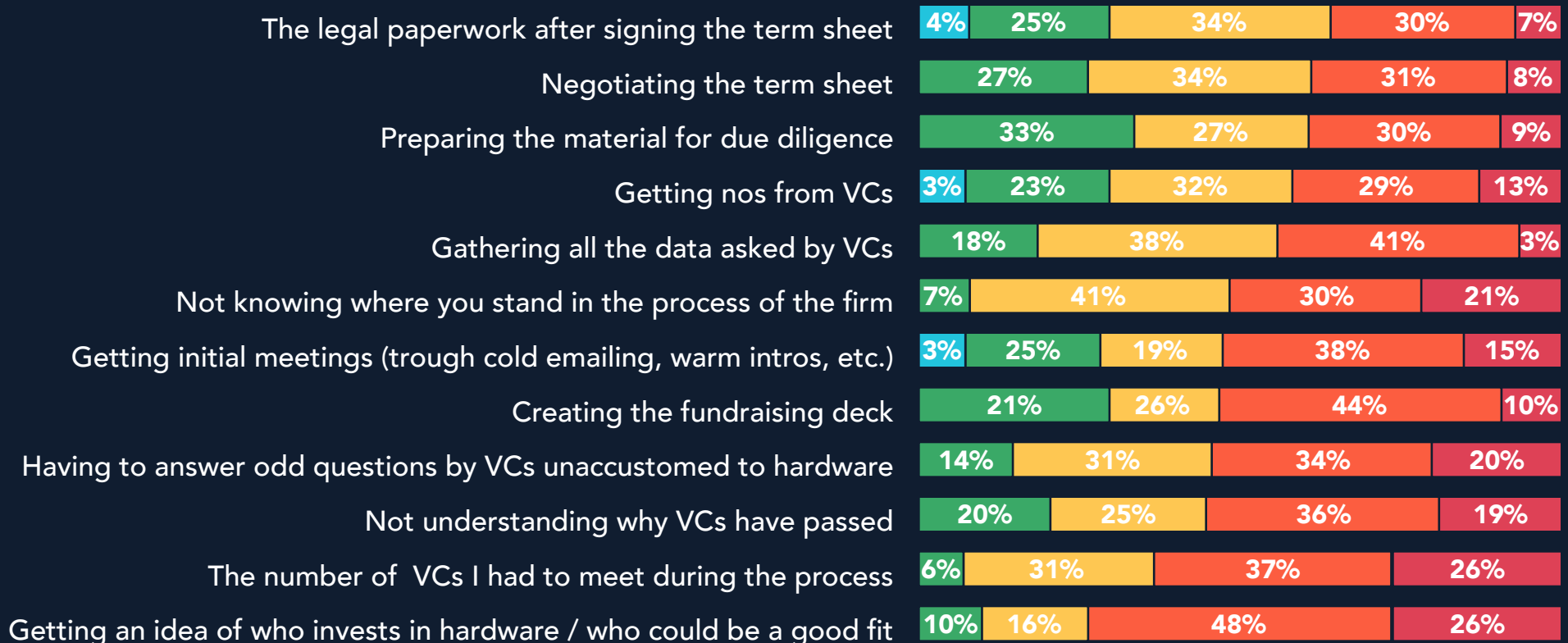


N.B.: Due to the limited number of answers obtained for series A rounds we decided not to feature the data.

Finding who invests in hardware / who could be a good fit is founders' biggest challenges regarding fundraising

54% of the companies find it very difficult or somewhat difficult to answer odd questions asked by investors who have no experience in hardware.

HOW DIFFICULT OR EASY WERE THESE ASPECTS OF THE FUNDRAISING PROCESS?



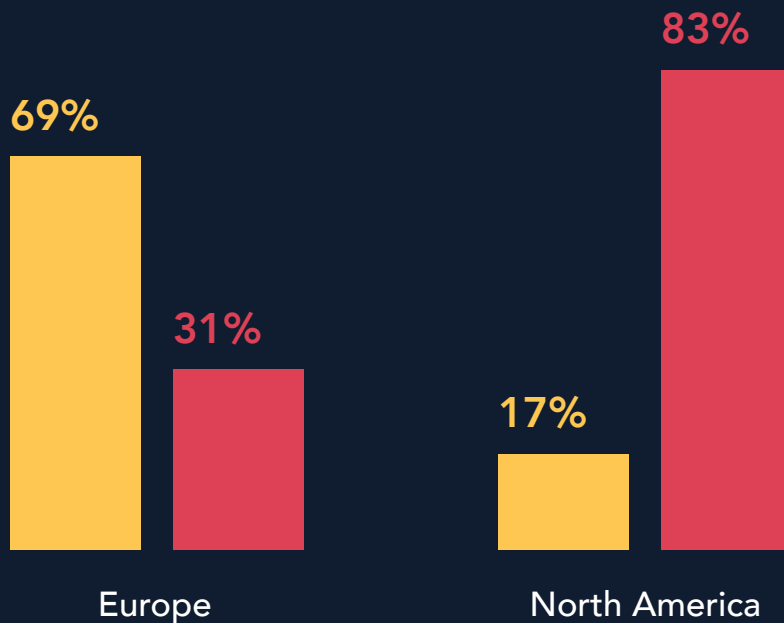
● Very easy ● Somewhat easy ● Neither difficult nor easy ● Somewhat difficult ● Very difficult

A majority of European respondents (69%) have benefited from grants

On one hand, 69% of the startups based in Europe received grant, which is x4 the number of North American companies who did so. On the other hand, the average amount of grants received in North America is almost twice as large as the average amount for European startups.

DISTRIBUTION OF GRANT FUNDING STATUS BY GEOGRAPHICAL AREA

- Received grant funding
- Did not receive grant funding



Average amount in grants received by startups

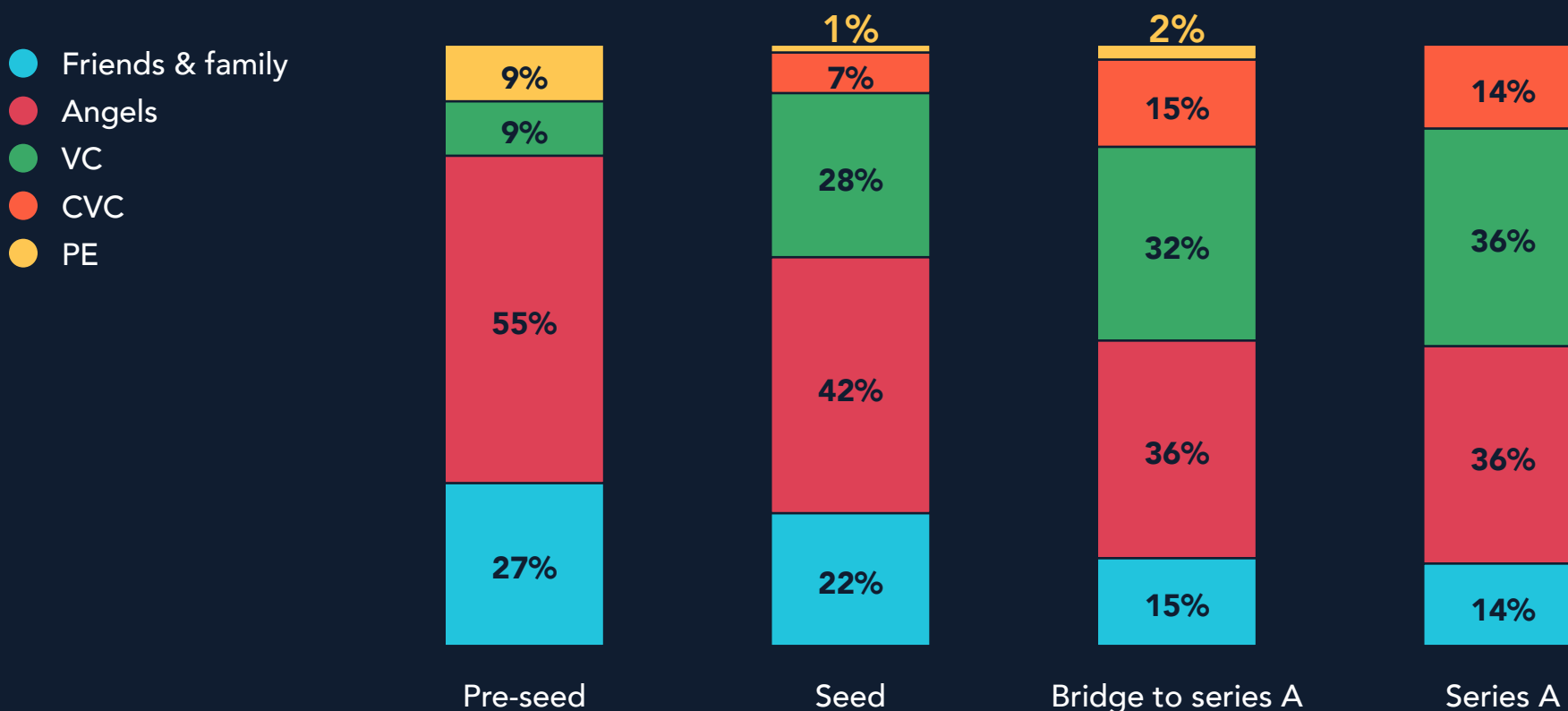
North America
\$909 208

Europe
\$461 354

Angels are the most represented class of investors across early-stage funding rounds

Among respondents, angels and friends & family account for more than 50% of the investors present on the cap table from pre-seed up to series A.

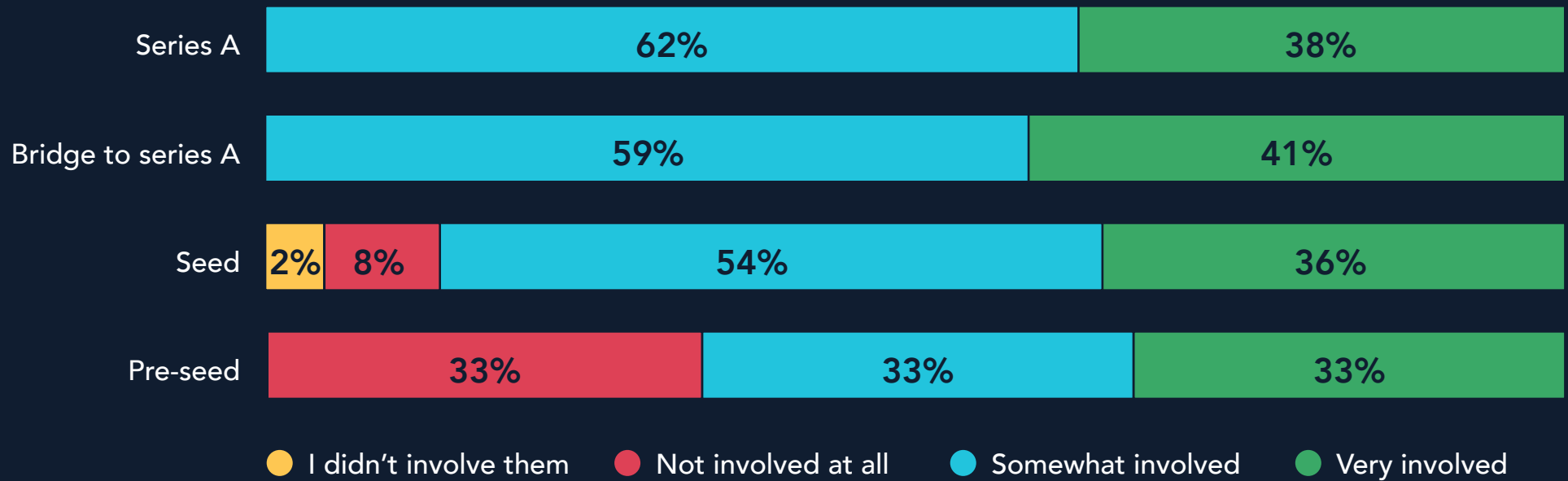
DISTRIBUTION OF TYPES OF INVESTORS PRESENT ON THE CAP TABLE BY LAST FUNDING ROUND



A third of the founders consider their investors to be very involved, no matter the funding stage

Most founders consider that their investors are "somewhat involved".

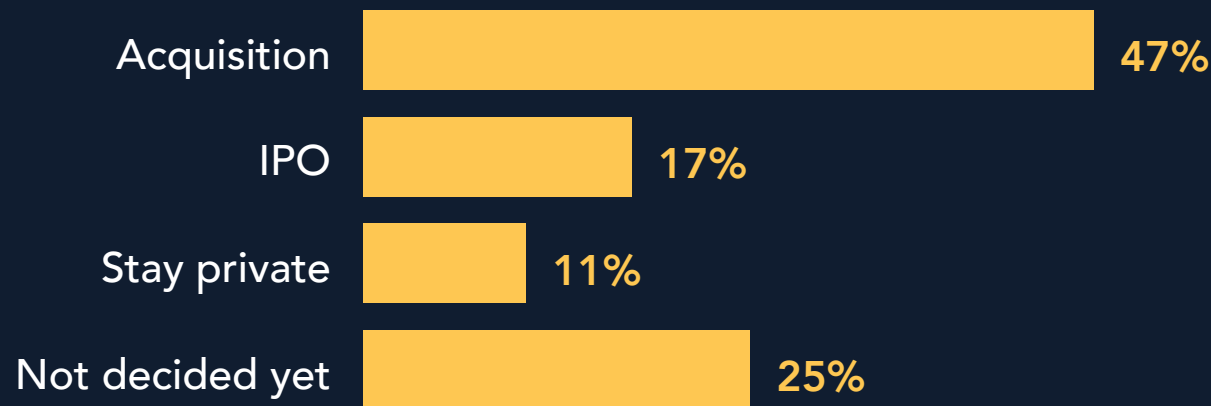
HOW INVOLVED ARE YOUR INVESTORS IN SUPPORTING YOU?



When it comes to their exit strategy, hardware companies majoritarily target acquisitions over IPOs

Only 17% of the respondents see the IPO as their realistic long-term goal for their company.

WHAT IS YOUR REALISTIC LONG-TERM GOAL FOR THE COMPANY?



Founders are optimistic regarding the M&A market for hardware startups

More than 50% of the respondents in Europe and North America predict more acquisitions to come in the hardware space

DISTRIBUTION OF M&A PROJECTIONS FOR HARDWARE STARTUPS BY GEOGRAPHICAL AREA

- Fewer acquisitions
- No change
- More acquisitions

