

BEST PRACTICES and ANSWERS to FAQs from INDUSTRY MENTORS

We assembled a world-class group of industry experts in the cyber-security field and asked them seven (7) key questions about best practices and FAQs. Their bios are at the end. Here's what they said.

1. What is the best business advice you have ever received?

[Jeehye Yun](#)

Find people smarter than you.

[Richard Marshall](#)

Make sure your projects are properly funded beforehand.

[Jeff Man](#)

See one, do one, teach one.

[David Balenson](#)

Expect the unexpected. Hire the best people to help you run the business; don't try to do everything yourself.

[Chris Shenefiel](#)

Know your customer.

[Angelos Stavrou](#)

To listen to your customers and adjust your product to meet their needs.

2. When people are trying to commercialize an idea or product, what's the biggest mistake they make in your opinion?

[Jeehye Yun](#)

"If you build it, they will come."

After value-proposition identification and validation, product-market fit is one of the toughest challenges to overcome in the early stages. Product-market fit can take years. Most assumptions about customer behavior, how they will use and interact with your product or service are often wrong. Even with a good understanding of customers in a particular sector, innovative ideas and new products take more effort for the customer to understand and adopt. Many cycles of failure and learning are required to build a product or solution people pay for.

There is also a false sense of security in doing too many blue-sky exercises with prospects and customers in the early stages. Blue-sky is not usually a validation of value or value-proposition. Until they are paying customers or evangelical users with an emotional stake in the product, most of the feedback

might be polite noise about how the solution could be used as opposed to actual usage information that helps develop the solution and converts them to customers.

Negative and actionable comments are more useful feedback than polite comments about how a user can think about potential uses. The potential use-case ideas are valuable after they convert to paying customers.

Richard Marshall

They believe their own press; the inventor wants to be the CEO.

Jeff Man

Assuming that technology solves the problem of information (cyber) security.

David Balenson

They focus on their technical approach, and forget to consider the important customer need, the unique and compelling aspect of their approach to providing a solution to that need, the benefit (per costs) of their solution, and why their solution is better than competing or alternative solutions.

Chris Shenefiel

They don't know their customer. Either they are building features that customers don't understand or even know they need, or they are building an excellent product with features that don't have a customer home.

Angelos Stavrou

They do not perform an early market survey and form an early business model to drive their engineering efforts. They don't protect their intellectual property early or they rely on intellectual property from universities without securing an exclusive license early on.

3. How important are mentors in this sector?

Jeehye Yun

Absolutely essential. Most startups will not have all the necessary skillsets in the beginning so having a network of mentors is important. Different mentors are necessary to address different problems and expertise related to a particular stage of the startup's life. Founders are resource-constrained so finding the right mentor at the right time and being able to focus on the right issues is key. A startup is told to do many things correctly but they only have so much time, focus and resources so learning from qualified mentors is critical.

Richard Marshall

Very much so if they bring the right experience.

Jeff Man

Extremely important. I had a mentor at the beginning of my career in the DoD, and if it weren't for his advice, I would not be where I am today.

David Balenson

I have always valued and benefited from the guidance and direction I have received from mentors throughout my education and career. I strive to model the positive attitudes and successful behaviors of the leaders of the companies for which I have worked.

Chris Shenefiel

In my life, mentors have had the greatest influence for me personally and professionally. The best mentor is someone who is schooled or experienced in a different field than yourself who has ideas and inspiration that comes from different disciplines and connections/contacts that the mentee would not normally meet.

Angelos Stavrou

All of us are bound to make mistakes. Having mentors help either avoid them or reduce their impact.

4. When people talk about best practices in this sector, what comes to mind?

Jeehye Yun

Lean Startup and Big Vision methodologies and their variations. Lean Startup offers systematic ways for scientists to approach defining their product's value, understanding the value proposition and identifying the customer-buyer. Both methodologies have pros and cons but ultimately any method that gets you to customer understanding, customer intimacy and conversion is key.

Richard Marshall

Cyber Security

Jeff Man

The severe lack of best practices. I saw a meme recently that said something about what's wrong with the industry is that basic, fundamental "security 101" requirements are often referred to as "best practices".

David Balenson

Keep it simple. Keep it real. Cybersecurity does not exist in and of itself. It is an integral part of cyber, which is an integral part of people, organizations, and society. Focus on the problem being solved and the benefits being provided.

Chris Shenefiel

Building upon the experience and mistakes of others. The worst scenario in cybersecurity is to try to implement something that is secure without standing on the shoulders of the giants that came before you.

5. What problems or issues should universities address to make commercialization easier for faculty?

Jeehye Yun

Exposing faculty to training and experienced personnel who have commercialized university technology and go-to-market. Commercialization is the tip of the iceberg. Faculty, like many startup founders will underestimate how difficult it is to commercialize, market and find customers. Again, the “If you build it, they will come” mentality exists.

Potentially match-making with business professionals who can help develop a plan.

Richard Marshall

Need to be open-minded and more business-oriented.

Jeff Man

While I value the educational process and consider myself a lifetime learner, I firmly believe there is no substitute for actual, real-world experience. Any opportunities for mentorship or internships should be sought to allow students better exposure to the realities of operating in the business world.

David Balenson

I strongly encourage universities and university departments to fully support faculty who wish to transition their research into solutions that can be widely deployed and used such that they can have an impact on people, organizations, and society.

Chris Shenefiel

Working in academia is different from working in the commercial sector. I have found the best investigators to be those who seek out the experience and advice from commercial experts to share industry needs, challenges and real-world problems. In this way, researchers often find new use cases for their work that they had never imagined. They also discover that a slight adjustment in their approach could have a significant impact on transition to practice.

Angelos Stavrou

Licensing and inventorship are not well defined and used at universities. Many universities are either neutral or hostile when university professors decide to have a startup because they treat it as a competitive activity to the role of the professor. Even universities that are trying to become startup friendly, they do not have all the components and incentives in place to mitigate the risk of working at a startup.

6. What advice would you give universities to overcome these issues?

Jeehye Yun

Finding a business-savvy partner, channel partner, and key employees with complementary skillsets and mentors to build the path to commercialization.

Richard Marshall

Frequent and meaningful conversations with successful business leaders.

Jeff Man

Seek internship opportunities, partnerships with local businesses, volunteer opportunities, guest speakers/lecturers from industry and business.

David Balenson

Provide business, IP, legal, and other support needed to help transition research into practice. Consider work towards transition in tenure decisions.

Chris Shenefiel

As I've said earlier, seeking insight from those who have a good technical or business background to help tune and adjust your work will have a modest impact on the research work but a potentially substantial improvement on applicability.

Angelos Stavrou

Talk to others that they have similar experience. Do not rely only on risk averse colleagues that have no experience or they draw their advice from their frustrated attempts to put together a startup. Realize that you have to treat the startup as seriously as your research activities that you excel at. You do need others, the technical idea and implementation is only a fraction of what it takes to make a novel idea a selling product.

7. What's been your most important lesson in grant writing?

Jeehye Yun

The most important parts of a grant proposal are the first sentence, the first paragraph and the first page, in that order.

Richard Marshall

Perseverance.

David Balenson

Start early. Write it down. Iterate, iterate, iterate. It's not real until it's written down. Share with others and solicit their feedback.

Chris Shenefiel

Know the goals of the grantor. RFP's often describe a broad scope of goals but the researchers who ask good questions to tease subtle aspects of the grantor goals could help differentiate one proposal from others.

Angelos Stavrou

I was very successful getting funding while I was at the university. This experience helped me do the same for the company and fuel its growth for the first few years until the product was mature to generate profit.

Background of Mentors and Their Companies:

Jeehye Yun

RedShred uses machine learning and natural language processing to help businesses find revenue. Over 3 million US businesses source federal, state and local opportunities to fight for their slice of a \$2T award pie.

I've built an IT services firm specializing in software development, open source and proprietary content management systems with clients such as National Geographic, NGC TV/Fox and the USMC.

Prior to that I was Director of Computing at the University of Maryland Institute for Advanced Computer Studies (UMIACS) and managed cybersecurity at the University of Maryland, Baltimore County.

Richard Marshall

Retired lawyer from NSA OGC. Business Consultant on Cyber legal and policy issues. CEO of SETI, a software development company. CEO of Cinturion Group, an international fiber-optic and subsea cable company. Corporate Counsel for Data on Acid, a cyber security international enterprise.

Jeff Man

Currently an independent consultant, advisor, and frequent conference speaker/trainer. Respected Information Security expert, advisor, and advocate. Over 34 years of experience working in all aspects of computer, network, and information security, including risk management, vulnerability analysis, compliance assessment, forensic analysis and penetration testing. Previously held security research, management and product development roles with the National Security Agency, the DoD and private-sector enterprises and was part of the first penetration testing "red team" at NSA. For the past twenty years, has been a pen tester, security architect, consultant, QSA, and PCI SME, providing consulting and advisory services to many of the nation's best known companies.

David Balenson

I have more than 35 years of cybersecurity R&D experience and work to drive programs and organizations to research, develop, test, evaluate, and transition innovative solutions to challenging cybersecurity needs. I currently work at SRI International, an independent, non-profit research center. I am part of a team that provides technical and programmatic support to the DHS S&T cybersecurity R&D program, including the Transition to Practice program. I also help teach SRI's Innovation Training to DHS performers.

Chris Shenefiel

I have worked as a consultant at a small Nuclear Power inspection company and at AT&T Solutions, I've worked in product development and marketing for Amteva Technologies (acquired by Cisco), Motorola and AT&T. In my nearly 20 years of engineering, product management and marketing experience, I have learned excellence in product development (SEI-CMM, Six Sigma) and been through significant market transitions such as the breakup of AT&T, transition from PBX's to IP Telephony and the rise of cybersecurity. I am currently at Cisco and am pleased to be working with a team of Cisco leaders (Fellows, Distinguished Engineers) with vast experience and industry influence as we define and execute a research plan to improve security for Cisco and the internet industry as a whole.

Angelos Stavrou

Dr. Angelos Stavrou is a founder of Kryptowire and a Professor at George Mason University and the Director of the Center for Assurance Research and Engineering (CARE) at GMU. Stavrou has served as principal investigator on research awards from NSF, DARPA, IARPA, DHS, AFOSR, ARO, ONR, he is an active member of NIST's Mobile Security team and has written more than 90 peer-reviewed conference and journal articles. Stavrou received his M.Sc. in Electrical Engineering, M.Phil. and Ph.D. (with distinction) in Computer Science all from Columbia University. He also holds an M.Sc. in theoretical Computer Science from University of Athens, and a B.Sc. in Physics with distinction from University of Patras, Greece. Stavrou is an Associate Editor of IEEE Transactions on Reliability and IET Journal on Information Security. His current research interests include security and reliability for distributed systems, security principles for virtualization, and anonymity with a focus on building and deploying large-scale systems. Stavrou received the GMU Department of Computer Science Outstanding Research Award in 2010 and 2016 and was awarded with the 2012 George Mason Emerging Researcher, Scholar, Creator Award, a university-wide award. In 2013, he received the IEEE Reliability Society Engineer of the Year award. In July 2017, Dr. Stavrou and Kryptowire received the DHS Cyber Security Division's "Significant Government Impact Award" for their efforts to analyze mobile applications. He is a NIST guest researcher, a member of the ACM and USENIX, and a senior IEEE member.

Kryptowire is a small, employee-owned company with a proven track record of commercializing cybersecurity products from government research. Since its inception, Kryptowire LLC has demonstrated success working on technologies developed under contract to the Federal Government including emerging technologies that required significant research and development before reaching the market. We have done this both under traditional technology contracts and subcontracts with the government as well as commercially.

Based originally on DARPA research from the Transformative Applications project, Kryptowire's flagship Mobile Application Analysis and Protection products are now supported, deployed, and in-use by dozens of commercial, defense industrial, and government enterprises, including large Fortune 500 companies (IBM, Koch Industries, HBO) and government organizations (DoJ, ARMY TRADOC, DHS HQ, TSA, CBP).

Kryptowire is one of the few vendors approved by Apple and Google to offer Mobile Device Management services for Android and iOS devices.

As part of this commercial offering, Kryptowire manages and protects mobile applications on thousands of devices for Library of Commerce and other organizations.

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