

The Johns Hopkins University

Startup Guide

A Guide to Technology Licensing and University Startups

START HERE

FASTFORWARD



JOHNS HOPKINS
TECHNOLOGY VENTURES



“An investment in our innovation ecosystem holds the potential to advance in profound ways our education, research and service and clinical missions, and contribute to the betterment of the city, the country and the world in which we live.”

Report of the Committee on the Innovation Ecosystem, May 2014

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Note: This guide was released in spring 2019. It is based in large part on Stanford University's Office of Technology Licensing "Start-up Guide" with adaptations for Johns Hopkins and Johns Hopkins Technology Ventures. We are grateful to Stanford OTL for their permission to use their materials. The information contained herein has been coordinated with Johns Hopkins conflict of interest committees as well as with relevant research administration divisions.

The Johns Hopkins University is world-renowned for its groundbreaking research, innovative faculty and culture of collaboration, which have all led to the development of life-changing technologies impacting lives around the world. This includes the discovery of restriction enzymes, CPR, the implantable defibrillator and pioneering work in cancer biology.

Discovery, research and innovation are at the heart of this institution. At Johns Hopkins, students, faculty and staff work together to tackle today's most vexing problems and develop tomorrow's solutions. This is a culture worth celebrating and supporting.



Johns Hopkins Technology Ventures (JHTV) guides Johns Hopkins inventors as they move ideas from the office or the lab to the market. Whether that means identifying translational funding and a partner to establish a startup or licensing the technology to an established industry partner, our goal at JHTV is to maximize the impact of our discoveries on the world.

When innovators decide to commercialize their technology, they embark on a unique and challenging journey. The information provided in the pages of this guide is intended to give direction to our entrepreneurs as they embark on this journey with us.





OVERVIEW

In recent years, there has been a heavy focus on entrepreneurship across the country. Johns Hopkins has embraced this zeitgeist and has invested significant resources into building supportive infrastructure across the university to bring ideas from our labs and offices to the market. The university, through Johns Hopkins Technology Ventures (JHTV) and its FastForward team, provides an array of services, funding and workspace options intended to support entrepreneurial endeavors. Whether a startup needs a BSL-2 wet lab or just a desk, whether they need a mentor to guide them or some early translational funding, whether they are licensing intellectual property to form a company or starting a nonprofit, the FastForward team exists to guide teams on their path.

In the last five fiscal years, 2,492 Johns Hopkins inventions from around the university have been reported to JHTV. The majority of our annual licensing agreements are made with established companies or “industry.” Increasingly, though, licenses are being granted to startup companies formed around a Johns Hopkins invention. While they still constitute a minority of our annual licenses, the pace of startup licenses has increased to an average of 14 per year, up from 10 per year over the last decade. Since 2013, 85 companies have been formed. Whether through an industry license or via a startup company, technologies created with the use of Johns Hopkins resources or in the course of the inventors’ institutional responsibilities for research education are subject to the intellectual property policies of The Johns Hopkins University. Some examples of startups based on intellectual property owned by Johns Hopkins and licensed through JHTV can be found on our website (ventures.jhu.edu).

At the end of the day, whether JHTV licenses technology to a startup or to an existing company, our goal remains the same: **to maximize the impact of The Johns Hopkins University's excellence in research by facilitating the translation and commercialization of discoveries into accessible technologies, products and services for the benefit of society.** In order to partner on commercialization efforts, it is critical that JHTV and its entrepreneurs are aligned on this mission.

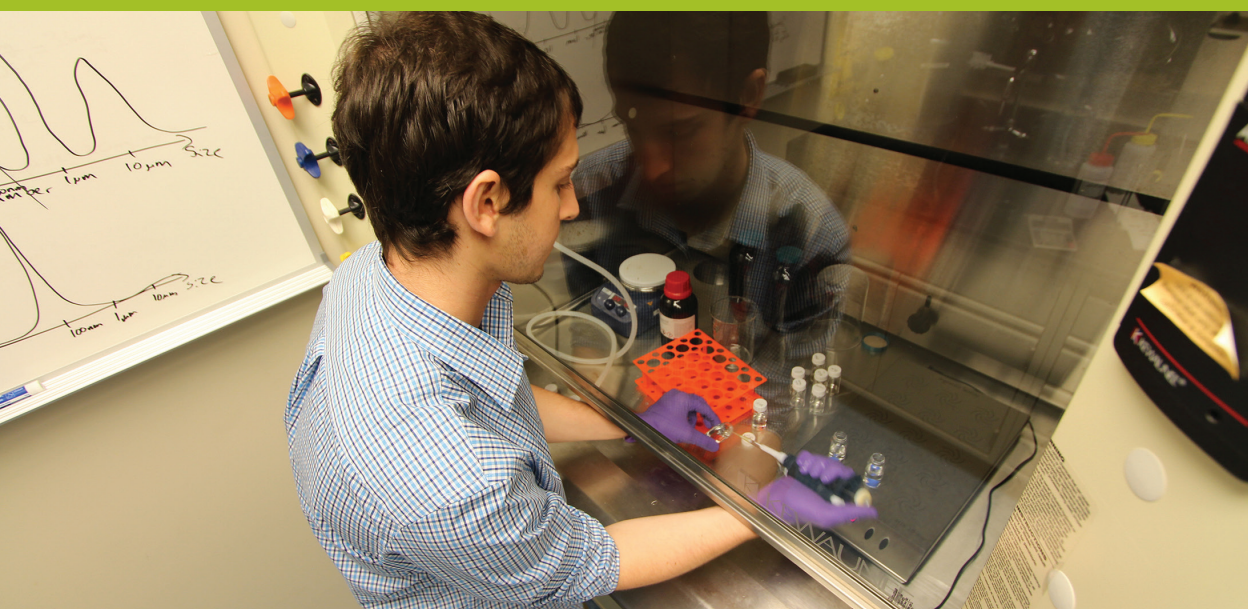
This guide summarizes some core expectations, duties and resources needed to set up these efforts for success.



Individuals are responsible for knowing and following Johns Hopkins University policies about conflicts of commitment, conflicts of interest and related matters. The greatest concern surrounds human research and studies for FDA approval of a drug or device. In these cases, approvals may be necessary from the Institutional Review

Board and/or the Johns Hopkins University School of Medicine Data Trust. Relevant policies can be found at this website, along with The Johns Hopkins University and Johns Hopkins Health System Policy on Institutional COI: web.jhu.edu/conflict_of_interest/JHU_Policies.

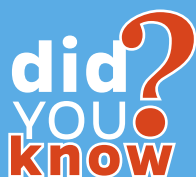
The Johns Hopkins University's technology transfer can be conceptualized as a continuous cycle wherein university discoveries are developed by licensees into products whose returns to the university help fund the next generation of research and innovation. For the most part, the steps of the cycle are similar whether the company commercializing the technology is a new venture or an established corporation.



UNIVERSITY TECHNOLOGY TRANSFER AT A GLANCE

Technology transfer is the movement of knowledge and discoveries from the research setting to the public for the benefit of society. This occurs in many ways, but for the purposes of this guide, tech transfer refers to the formal licensing of intellectual property to third parties, whether established industry players or new startup companies.

Through a license, the university (known as the **licensor**) grants its rights (such as the ability to make, use and sell products, as well as to sublicense and pursue patent infringers) in the defined technology to a third party (known as the **licensee**) for a period of time, sometimes for a particular field of use and sometimes limited to certain regions of the world. In exchange for that grant of rights, licensees must meet certain performance requirements and pay royalties to the university, which are shared with the inventors, the inventors' schools and the inventors' departments to provide support for further research and education.



The Bayh-Dole Act of 1980, which led to the modern era of university tech transfer, allows universities to have ownership rights to discoveries resulting from federally funded research, provided certain obligations are met. These obligations include making efforts to protect (when appropriate) and commercialize

discoveries, submitting progress reports to the funding agency, giving preference to small businesses that demonstrate sufficient capability and sharing any royalties with the inventors. Unless the university returns the technology to the inventor(s), it is the university that owns the discoveries. The inventor(s) will benefit from any resulting commercialization efforts when the university decides to patent or protect the invention.

Through this process, established companies or startups can use The Johns Hopkins University's discoveries and inventions to develop services and products that benefit society and transform the world.

Johns Hopkins Technology Ventures is the office responsible for facilitating and optimizing this commercialization activity. It is our mandate to protect and market the discoveries and inventions created at the university, whether it is a new medical device or an app for mobile phones. It is our goal to partner with you in maximizing the impact of your discoveries. Specifically, we:

- » **Evaluate** promising technologies reported by faculty, staff and students.
- » **Protect** the technology with patent, trademark or copyright filings.
- » **Market** them to industry with the hope of finding one or more investors or companies interested in developing products based on the technology.
- » **Negotiate** license agreements with the interested parties.
- » **Maintain** relationships with the companies developing products based on the licensed technology.
- » **Support** and **advise** faculty in determining the optimal commercialization path.

JHTV aims to provide excellent service to our faculty, staff and student customers from the disclosure of invention all the way through to the distribution of any resulting income from licenses.



UNIVERSITY STARTUPS

One path for university-based technologies involves founding a company to license the technology and then bring it to the market. Launching a successful startup company requires commitment, dedication and perseverance. Johns Hopkins University faculty and the startup entrepreneurs with whom they partner must have unbending passion, optimism and faith in the technologies, along with an eagerness to commit their own time and resources to develop these inventions. Many companies fail even if the core technology is innovative and promising. Meanwhile, when the right technology is implemented at the right time, it has the potential to benefit society significantly. Components of a successful startup include a compelling concept, a strong market opportunity, a competitive advantage, a sound business and financial plan and an experienced, full-time management team. Luck and timing also play an important role.

Entrepreneurs spearheading the new company formation will be the key champions for the technology and the startup. In addition to navigating the standard technology transfer process, they are responsible for a variety of tasks such as identifying the market opportunity, developing a business plan and pursuing financing. Every startup follows its own unique path, but there are some common steps that will help a business get off the ground.

Through careful validation, technology development and business planning, an inventor will save significant time and money in the process of commercialization. For example, conducting critical experiments,

prototyping and testing, should precede the licensing process. To assist with these early validation processes, JHTV can help identify mentors and small amounts of translational funding. If a startup company is formed in order to commercialize a technology, JHTV will negotiate with that new company to craft the appropriate agreement that is consistent with other licenses and that helps them succeed. JHTV is committed to working with startup companies early to give them the strongest start.

FASTFORWARD

FastForward, a division of JHTV, represents a coordinated suite of resources designed to assist startups with efficiently moving technologies to the marketplace. **FastForward** is prepared to screen technologies for startup venture potential and, when appropriate, to facilitate the development of a commercialization plan for advancing the venture. We also help entrepreneurs navigate legal, market, operational, funding, talent, strategic and other hurdles all the way from company formation to advanced venture capital deal-making. In addition to these offerings, **FastForward** has a mentor-in-residence program that provides entrepreneurs advice and connections to funding sources. One of the most visible parts of **FastForward** are its Baltimore innovation hubs, which provide affordable, flexible coworking, office and lab space for startup companies at both the Homewood and East Baltimore campuses.

Some Johns Hopkins faculty and students ask if **FastForward** is willing to start a company based on their technology. **FastForward** does not create its own startups but rather assists Hopkins' faculty, students and staff who wish to do the hard work to start their own companies. Remember, faculty need to identify an outside entrepreneur with whom they can partner to create the company and license the technology out of The Johns Hopkins University.

Getting the Business Off the Ground

Johns Hopkins' approach to engaging with entrepreneurs is to provide an environment that encourages networking and collaboration across disciplines and industries; to offer opportunities for testing ideas; to be open and welcoming to new and experienced entrepreneurs and investors; and to maintain transparency regarding university policies. JHTV is one small part of the Johns Hopkins entrepreneurial culture, with 48 companies started around technology licensed through the office since 2016.

JHTV's goal is to have Johns Hopkins inventions commercialized for society's use and benefit. When entrepreneurs are passionate and committed to making that a reality, we are eager to work with them to negotiate an agreement and to help them succeed.

5 Common Steps to Consider

Every startup follows its own unique path. However, there are five common steps to help the business take off:



- 1. Connect with the ecosystem.**
- 2. Develop a business case.**
- 3. Pursue investors/funding.**
- 4. Exit strategy.**
- 5. Pitfalls.**



Connect with the Ecosystem

Startups are the product of an ecosystem. Connecting to the entrepreneurial community will create the foundation for a successful business. The entry point to the Johns Hopkins startup ecosystem is JHTV's FastForward team, which offers a variety of resources and networking opportunities to support Johns Hopkins entrepreneurs on the path to commercialization. The university has formal programs and entrepreneurship classes, which, when combined with informal advice from advisers, friends and colleagues, can help shepherd entrepreneurs through all facets of the startup process—such as identifying a business model, attracting startup management talent, selecting board members and meeting potential investors. Other schools and departments within the university offer additional educational opportunities.

Starting a company will be time intensive. Entrepreneurs should be careful to separate their outside startup activities from their Johns Hopkins University responsibilities. Faculty should consult with department chairs or appropriate conflict policies to determine the allowable time for outside professional activities, and students need to consult with advisers overseeing their academic progress.





Develop a Business Case

Those pursuing the path of entrepreneurship should construct a thoughtful business case with mentorship from a FastForward mentor or an individual(s) with significant experience. Business cases should include a plan for developing the technology, attracting needed investment and obtaining sufficient revenue to sustain and grow the company. Oftentimes, a grant submitted for the purposes of securing translational funding will contain many of the elements required for a business case and can thus provide a good guide. This plan will be useful when meeting with investors and pursuing funding. Entrepreneurs should consider several key factors when forming a startup company:

- » **Problem or opportunity** – What is the problem or opportunity that this technology addresses? What is the definition and size of the market (incidences, procedures, etc.) and the dollars spent? How much of this market could you reasonably capture?
- » **Value proposition** – What problem are you solving, situation are you improving or opportunity are you creating? What benefits will the costumer accrue as a result? (Product features are not a value proposition – they help to deliver the value.)
- » **Technology innovation and patent/IP position** – Is broad patent coverage possible? Are there background patents owned by others? Do others have intellectual property rights that will block you from developing the product?
- » **Development risk** – How far along is the technology? How much time and money is required to bring the product to market? What are the sources of capital that might be available given the stage of the technology and the milestones necessary to achieve critical path development? What is the key set of experiments that will allow us to quickly determine whether the product or service is viable?
- » **Development costs versus investment return** – Can investors obtain their required rates of return (e.g., 10 times initial investment in five years)?
- » **Product strategy** – Does the technology lend itself to opportunities for multiple products/platforms?

- » **Market size, dynamics and potential** – Is the market big enough? Is it controlled by a few players? Is there a healthy growth trend?
- » **Financial potential** – What market share can be obtained? Is it worth the effort?

A business plan should be clear and concise. This will make it easier to “sell” the vision to investors and to attract management talent with a formal business plan. Investors are interested in investing in startups with high growth potential. The business plan should address what investors want to know: the compelling concept, competitive advantage (including patent/IP position), market and financial potential, and proven management team. The business plan is generally a confidential document and should be carefully distributed. FastForward will work with entrepreneurs to assess the business plan and provide feedback on initial presentations for potential funders.

Components of a typical business plan include:

- » **Company name** – Finding the right name (brand) can be challenging, but it is critical. Choose a name that is unique but will not limit the growth of your company in its specificity.
- » **Mission statement** – A guiding vision for your company will help to convey its purpose to both the company internally and to external stakeholders.
- » **Problem or opportunity** – What is the problem or opportunity being addressed by the technology? What is the definition and size of the market–incidences, procedures, etc.–and the dollars spent? How much of this market could you reasonably capture? Is it a consolidated or fragmented industry?
- » **Value proposition** – Which products or methods will you develop, and how does this address existing problems, improve existing solutions or create new opportunities? What specific benefits might accrue to the customer(s) as a result? What are its applications? What are the company’s unique advantages, and are those advantages sustainable? How will the current market change due to the company’s products, methods, etc.?
- » **24-Month action plan and critical path items** – What will the company

accomplish in terms of research and product development milestones? What resources are necessary to achieve these goals (capital, management, technical, etc.)? What are the key risk factors and plans to mitigate? How much grant funding have you raised that can be leveraged?

- » **Business model** – How will you generate revenue and profit? What is the marketing and sales strategy (pricing, product placement, etc.)? How will the target market know about the product? Which sales distribution channels will you use?
- » **Competitive analysis** – What is the competitive landscape, and how does your technology compare? What is your intellectual property and state of protection? What are key success factors and metrics as defined by users and purchasers? How does your technology address these success factors and metrics to create a true competitive advantage?
- » **Financial forecast and use of funds**
 - › Financial projections – When will the company break even?
 - › Key milestones required to meet projections
 - › Key metrics to be measured and tracked
 - › Key assumptions and how they change based on a competitor's response
 - › Funding requirements, sources and uses
- » **Management team** – Members with resumes/CVs and roles. Who is the team and how are they prepared to deliver value?

Companies should be prepared to consolidate their business plan into a concise pitch deck (See page 42 - **Helpful Resources: Investment presentation guide**).





Pursue Investors/Funding

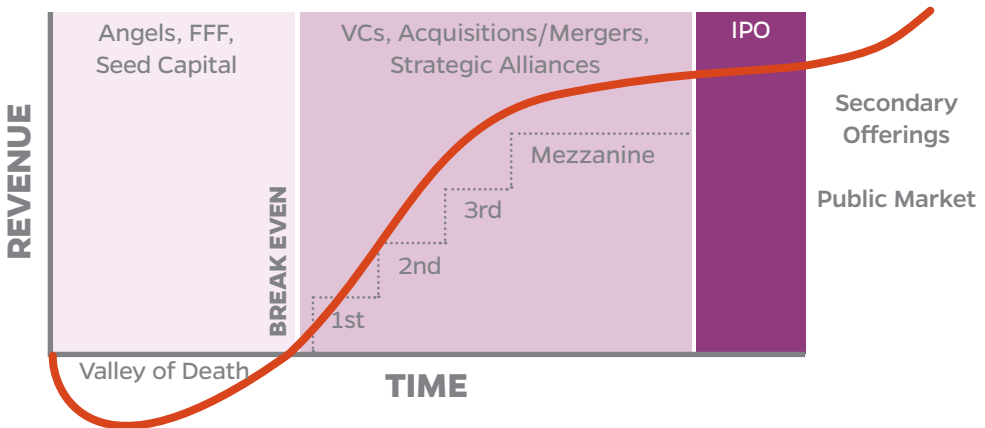
Commercializing technology is typically a capital-intensive process, with the exception of some software companies. Entrepreneurs should be prepared to spend significant energy presenting their opportunity to people with the funds to help them make it happen. Typically, these are venture capitalists, angel investors and—especially in the initial stages—friends and family. Technology commercialization often requires multiple rounds of funding from multiple sources. The Johns Hopkins network can be leveraged to start the personal introduction process and to help get the attention of angel and venture capital investors. FastForward has dedicated resources to help startups identify potential funding partners across all stages of investment.

Angel investors and venture capitalists (VCs) are private investors who take on high-risk ventures with goals of high returns. Return requirements vary based on industry and stage of funding, but many investors are seeking a significant return on their initial investment, given the high-risk nature of early stage investing.

A determination of which type of capital to pursue depends heavily on the unique context of the venture opportunity. The definitions below are meant to help familiarize first-time entrepreneurs with terms that they may encounter during the startup process. **The Johns Hopkins University strongly recommends that you partner with a representative from FastForward before engaging with funding sources.** Our pitch guide and



STARTUP FINANCING CYCLE



This graphic is an example of a startup financing cycle using traditional funding sources, through an initial public offering (IPO). There could be more or fewer rounds of funding. The 1st, 2nd and 3rd rounds can be equivalent to Series A, B and C. (Source: "Startup Company" Wikipedia, the Free Encyclopedia. Wikimedia Foundation, Inc. 25 June 2015. Web. March 2018 <commons.wikimedia.org/wiki/File:Startup_financing_cycle.svg>)

sessions can help demystify the process of how to ask for capital.

Nontraditional Funding

Startups are encouraged to pursue funding from nontraditional sources. Often, these sources of capital are nondilutive. Nondilutive funding is financing that does not require equity in exchange for the money; i.e., it does not diminish or dilute existing shareholders' stake in the company. Inventors should consider pursuing these options before turning to other forms of investment funding. Some examples of these are:

- » **University commercialization funds** – Friends of Johns Hopkins who value economic development and commercialization of technology have provided funds to help move startups from concept to incorporation. Find funding opportunities at: ventures.jhu.edu/find-translational-funding.

These translational grants provide nondilutive forms of funding to move technologies forward. The FastForward team is ready to help

guide teams to appropriate funding opportunities.

- » **Government grants** – Certain research grants are available through programs such as Small Business Innovation Research and Small Business Technology Transfer (SBIR/STTR; [sbir.gov](https://www.sbir.gov)) or the Department of Energy (arpa-e-foa.energy.gov). Some of these grant programs require that researchers spend at least 50 percent of their time at the applicant company. Accordingly, faculty may need to step down from full-time appointments as they pursue these grants.

Teams can access consultants to assist with these grants through FastForward. The state of Maryland also provides different types of startup funding through the Technology Development Corporation of Maryland (TEDCO; tedco.md), including the Maryland Innovation Initiative. FastForward has resources in place to assist teams in applying for TEDCO grants and other funding.

- » **Banks** – Banks do not usually participate in equity investments in new companies, but they are a source of loans, particularly for capital purchases when there is some kind of collateral (such as large equipment).
- » **Crowdfunding** – A number of companies enable entrepreneurial fundraising by pooling small investments from a network of individuals.

Angel Investing

Angel investors are typically high net worth individuals who have a personal interest in funding new companies. They operate both individually and in networks of varying sizes. Angel investors are often willing to invest in earlier stages and with smaller amounts of money than VCs, in exchange for equity. They can take passive or active roles in the startup and typically have a longer investment horizon than VCs. FastForward works with a variety of angel investors and can advise teams in navigating these networks and with respect to term sheets.

Venture Capital

Vcs are professional investors who retain a share (typically 20 percent) of profits they generate for their investors. Compared to angels, VCs can

invest larger amounts of money (usually millions of dollars) in a company, and they tend to receive more equity in exchange. VCs may also exercise control and can bring experienced management talent and contacts to help guide and grow the company. Sometimes they invest in several rounds of funding and are part of a larger consortium of investors in the company. Venture investors are usually interested if the market for a given product will deliver in excess of \$100 million in revenue. FastForward helps teams with introductions to venture capital firms, when appropriate.



How Investors Evaluate a Company

Investors listen to pitches constantly, but only a small portion of startups receive funding. The investors will determine if the startup meets their investment criteria and, in their view, possesses the potential for sufficiently high returns. VC funds target returns that are many multiples of their invested capital, which is significantly higher than other investment vehicles such as stock and bond mutual funds.

Investors typically perform due diligence before funding new opportunities, and they often view the fact that a new company is working with JHTV positively in this analysis. For example, JHTV's involvement may provide an extra measure of reassurance to investors that IP rights are being properly secured by the company. Bear in mind, however, that JHTV will carefully evaluate the patentability and commercial potential of an invention before embarking on the costly and lengthy process of obtaining patent protection.





Prepare an Exit Strategy

Investors plan to recoup their investments via exit strategies. Typically, a VC hopes to sell its equity in a portfolio company within three to seven years, ideally through an initial public offering (IPO). Another exit strategy could be through a merger with or acquisition by another company instead of an IPO.



Beware of Pitfalls

New company formation is a high-risk proposition. Some Johns Hopkins startups are successful, while others are not. Common problems that can cause academic startups to fail are:

- » **Technology does not meet commercial need** – Sometimes the science is innovative and exciting but does not correlate to a critical commercial need. Sometimes, current solutions are still better than the new technology. JHTV encourages startups to participate in educational programs such as I-Corps (dcicorps.org), a program offered quarterly by JHTV. The National Science Foundation developed I-Corps based on Steve Blank's lean startup methodology to assist scientific teams in determining the commercial viability of their product or service by focusing on customer validation.
- » **Marginal niche** – If the target market is smaller than expected, the company may not meet its financial targets.
- » **Lack of funding** – A startup needs sufficient capital to overcome technical challenges, reach critical business milestones and progress to the next phase of development. To attract investors, the company must have a solid business plan and a strong management team.
- » **Inexperienced management** – A strong, experienced, cohesive team is required for a successful startup company. Problems can arise if founders or other members of the team do not have enough startup and business experience or if founders, new management and

investors do not have the same strategic vision. The composition and quality of the management team is one of the first things that investors consider and is critical for success. It is crucial that teams have a full-time person in place to help move the venture forward.

- » **Timing** – Even when a commercial need exists, the company may miss the market. Sometimes, the market is not ready for a product. For example, your startup could be too early, still too expensive or meet an as of yet unrecognized need. Conversely, sometimes the product is too late to the market and the need has already been filled by a different technology, or competitors have leapfrogged the company with an even better product.
- » **Bad luck** – Sometimes events outside the entrepreneur's control can negatively impact a company.



Student Startups and IP

For the most part, Johns Hopkins students retain ownership of the intellectual property that they create. However, if students receive remuneration for services that result in an invention, student intellectual property shall be assigned to The Johns Hopkins University and governed by the university's IP policy. JHTV can help students navigate this question or students can reference: ventures.jhu.edu/the-johns-hopkins-ip-policy.





The IP Marketing Blog Offers 10 Tips for Startup Valuation

1. Place a fair market value on all physical assets (asset approach).

New businesses normally have fewer assets, but it pays to look hard and count everything you have. Be sure to include computer equipment, office equipment, furniture, tools, and the value of inventory or prototype products, including development costs.

2. Assign real value to intellectual property.

The value of patents and trademarks is not certifiable, especially if you are only at the provisional stage. A rule of thumb often used by investors is that each patent filed can justify a \$1M increase in valuation.

3. All principals and employees add value.

Assign value to all paid professionals, as their skills, training, and knowledge of your business technology is very valuable. Back in the “heyday of the dot.com startups,” it was not uncommon to see a valuation upped by \$1 million for every paid full-time professional programmer, engineer or designer.

4. Early customers and contracts in progress add value.

Every customer contract and relationship needs to be monetized, even ones still in negotiation. Assign probabilities to active customer sales efforts, just as sales managers do in quantifying a salesman’s forecast. Particularly valuable are recurring revenues, like subscription amounts, that don’t have to be resold every period.

5. Discounted cash flow (DCF) on projections (income approach).

In finance, the income approach describes a method of valuing a company using the concepts of the time value of money. The discount rate typically applied to startups may vary anywhere from 30 to 60 percent, depending on maturity and the level of credibility you can garner for the financial estimates.

6. Discretionary earnings multiple (earnings multiple approach).

If you are still losing money, skip ahead to the cost approach. Otherwise, multiply earnings before interest, taxes, depreciation and amortization (EBITDA) by some multiple. A target multiple can be taken from industry average tables, or derived from scoring key factors of the business. If you have no better info, use 5x as the multiple.

7. Calculate replacement cost for key assets (cost approach).

The cost approach attempts to measure the net value of the business today by calculating how much it could cost for a new effort to replace key assets.

8. Find “comparables” who have received financing (market approach).

Another popular method to establish valuation for any company is to search for similar companies that have recently received funding. This is often called the market approach, and is similar to the common real estate appraisal concept that values your house for sale by comparing it to similar homes recently sold in your area.

9. Look at the size of the market and the growth projections for your sector.

The bigger the market and the higher the growth projections are from analysts, the more your start-up is worth. For this to be a premium factor for you, your target market should be at least \$500 million in potential sales if the company is asset-light, and \$1 billion if it requires plenty of property, plants and equipment.

10. Assess the number of direct competitors and barriers to entry.

Competitive market forces also can have a large impact on what valuation your company will garner from investors. If you can show a big lead on competitors, you should claim the “first mover” advantage. In the investment community, this premium factor is called “goodwill” (also applied for a premium management team, few competitors, high barriers to entry, etc.). Goodwill can easily account for a couple of million dollars in valuation.

Resource: IP finance - “Ten tips for start-up valuation”

ip.finance/2009/10/ten-tips-for-start-up-valuation.html



Faculty Roles in Startup Companies

An important immediate question for Johns Hopkins University inventors is whether they want to be involved in these tasks directly as part of the company team or to hand off these tasks to professional entrepreneurs and continue in their roles as Johns Hopkins University faculty, research staff or students. For help with this decision, faculty should strongly consider conferring with a JHTV faculty mentor or another member of JHTV.

First-time entrepreneurs frequently underestimate the time and intellectual commitment required to successfully launch a new venture. The burden of these commitments has the potential to adversely impact a faculty member's or student's university work. The best guidance on how or even whether to balance these activities comes from those who have done it before. Inventors will also find critical guidance in the university's Conflict of Interest Policy. When faculty members start or become involved with early stage companies, that participation raises a variety of concerns around conflicts of interest, conflicts of commitment and intellectual property. Faculty often seek guidance as to what titles they may hold in early stage companies. Each of these situations is unique and fact-specific, and it is impossible to create general rules around acceptable faculty roles in startup ventures.

The following chart provides general information about the university's approach to faculty roles in startups, but the university will respond to a proposed arrangement in the manner that best suits the particular nature of the proposal and related implications.

FACULTY ROLES IN STARTUPS		
Company Role	Institutional Concern	Institutional Approach
Founder	Conflict of commitment, conflict of interest	Generally allowed. Requires division-approved management plan
C-Level Executive (CEO, COO, CMO, CSO, etc.)	Conflict of commitment, conflict of interest	May be allowed. If approved, requires a corresponding reduction of university responsibilities and division-approved management plan
Research Director, Researcher	Conflict of commitment, conflict of interest, intellectual property	Not allowed except at WSE. At WSE, requires division-approved management plan
Consultant	Conflict of commitment, conflict of interest, intellectual property	Generally allowed with a division-approved management plan





UNIVERSITY POLICIES: CONFLICTS OF INTEREST

Faculty, staff and student participation in startup companies may assume a variety of university policies, including but not limited to policies on conflicts of commitment, conflicts of interest and intellectual property. Below is general information about some of the relevant policies. This information is for educational purposes only and does not supersede or replace any university, divisional, school or department policy.

Intellectual Property Policy and Ownership

The Johns Hopkins University's Intellectual Property Policy is outlined in the Research Policy Handbook: ventures.jhu.edu/the-johns-hopkins-ip-policy. For new companies started by Johns Hopkins faculty, staff or students with technology falling under Johns Hopkins' policy, ownership of IP rights will be with the university. This ownership applies to any sort of IP, including patents, copyrights on software, semiconductor maskworks, data, tangible research property and trademarks.

Obligation to Sponsors

When an inventor reports IP to JHTV, he/she should take particular care to acknowledge all sponsors, including companies whose funding or materials led to the invention. Sponsored research agreements may specify what rights a sponsor has in any IP developed as a result of the sponsored research. Under most circumstances, federal funding of research leading to an invention will not impose significant impediments on commercializing the invention via a company, including startups. Funding or materials provided by other, nonfederal entities may result in license rights to those entities, limiting the license rights available for a company—again, including startups.

Corporate sponsors are typically granted rights to negotiate a license for any IP arising from sponsored research, but sponsorship agreements vary widely. JHTV reviews the research agreements listed on the invention disclosure to identify any licensing restrictions on the invention.

Conflict of Interest & Conflict of Commitment Disclosure Requirements

Full-time and salaried part-time faculty are required to disclose outside activities and financial interests that are related to their institutional responsibilities. Nonfaculty investigators who propose to participate in research conducted under the auspices of The Johns Hopkins University must disclose compensated outside activities and financial interests that are related to their institutional responsibilities. These disclosure requirements include, but are not limited to, the following:

- » Consulting or advising under a private agreement (e.g., consulting or scientific advisory board agreement)
- » Entitlement to royalty or other distributions under an option or license agreement
- » Receipt of royalty or other distributions
- » Equity ownership (includes startups)
- » Fiduciary role (includes startups)

A disclosure must be submitted in the online system, eDisclose (web.jhu.edu/conflict_of_interest/eDisclose), prior to the start of a new outside activity or financial interest, and an update must be submitted when a previously disclosed outside activity or financial interest changes or ends.

Disclosures are reviewed by divisional offices to ensure outside activities adhere to policies regarding professional commitment. These reviews will also determine if financial interests are related to the investigator's research and, if so, whether the arrangement constitutes a potential financial conflict of interest (FCOI) in research (See page 31 - **Financial Conflicts of Interest in Research (FCOI)**).

Professional Commitment

Johns Hopkins faculty members owe their primary professional allegiance to the university. **Their primary commitment of time and intellectual energies should be to the education, research and scholarship programs of the university.** The determination as to whether a particular outside activity constitutes an acceptable or unacceptable commitment is a joint responsibility of the faculty member's department director (or, in some cases, division director) and his/her divisional office. Outside activities are reviewed for compliance with university and divisional policies and standards, including:

- » Time commitment
- » Conflict of commitment with duties at Johns Hopkins
- » Use of the Johns Hopkins name by and/or in connection with an outside activity
- » Use of Johns Hopkins facilities and/or resources
- » Academic freedom
- » Certain activities that may be regulated by the faculty member's school (For example, Johns Hopkins University School of Medicine faculty may not provide clinical care outside the institution under a private agreement.)

More detailed information regarding disclosure and professional commitment is available at web.jhu.edu/conflict_of_interest/disclosure_requirements.

Private Consulting or Advising and Ownership of IP

Generally, Johns Hopkins faculty may provide expert advice to companies, including startups, under private consulting or advising agreements. Johns Hopkins does not review the text of private agreements, but faculty should disclose the proposed arrangements for review in eDisclose (edisclose.jhu.edu) prior to signing an agreement or initiating the work to be performed. Under private agreements, faculty may advise a company, but may not perform or direct research at or on behalf of a company.

In all instances, the private agreement between a faculty member and outside entity should be clear as to the delineation between the faculty member's university work and the work to be performed under his/her private consulting or advising agreement. The separation and distinction must be clear to all parties. This is of particular importance when a faculty member is a founder of the company. Faculty startups present have some of the greatest potential to blur the lines between private consulting and Johns Hopkins research and other responsibilities.

Faculty Involvement in Startup Negotiation

When a faculty member creates a startup, he/she may not negotiate with Johns Hopkins on behalf of the company. Although faculty members may not negotiate with the university on behalf of their companies, faculty startups may support research at Johns Hopkins, provided the sponsored research agreement or sub-award is administered through the appropriate Johns Hopkins research administration office and the required conflict of interest and FCOI review has been completed and the proposed work approved (See page 31 - **Financial Conflicts of Interest in Research (FCOI)**). Under common conflict of interest management plans put into place after COI and FCOI review, junior faculty, students, trainees, etc. may participate in this research at The Johns Hopkins University provided that the faculty member's relationship with the company is disclosed to these individuals. There may also be other conditions to meet to ensure transparency of the arrangement and protection of the individuals' rights and interests. However, the faculty member generally may not involve junior faculty, students, trainees, etc. in activities at his/her company. Additional conditions, including disclosure of the funding relationship in publications, will likely also be required to manage the conflict of interest.

When a question arises as to the appropriate delineation between a faculty member's university responsibilities and his/her private consulting activity, the faculty member should discuss the situation with staff in the school of his/her primary affiliation. Contact information is available at web.jhu.edu/conflict_of_interest/contact_us.

Individual Financial Interests

When an investigator discloses financial interests related to his/her institutional responsibilities, staff in the school of his/her primary affiliation review the information to determine if the financial interest is related to his/her research. An investigator's financial interest is related to his/her research when it can reasonably be determined that the **financial interest**:

- 1) Could be affected by the research.
- 2) Is in an entity whose financial interest could be affected by the research.

When a determination has been made that an investigator's financial interest is related to his/her research, the arrangement may constitute an FCOI. An FCOI exists when the investigator's financial interest could directly and significantly affect either the design, conduct or reporting of the research.

Financial Conflicts of Interest in Research (FCOI)

Johns Hopkins encourages commercialization activity that promises to move innovations from faculty laboratories to the market and other settings for the advancement of human health and welfare. This includes commercialization via licensing and/or private consulting or advising relationships with startups. However, the financial interests that come with these ventures may affect the integrity and objectivity of a faculty member's research, academic freedom, institutional reputation, safety of human subjects involved in the research and/or the rights and interests of students and trainees.

It is important to know that in many cases FCOIs are allowed. Many FCOIs can be successfully managed with measures designed to protect the faculty member and the university against risks to research integrity, reputation, safety of human subjects and the rights of trainees. FCOIs are reviewed on a case-by-case basis by staff in the school of the faculty member's primary affiliation in consultation with the divisional COI committee. Reviews will take into consideration the nature and magnitude of the financial interest for both

the individual and the institution, as well as the nature of the related research. Many FCOIs that involve nonhuman subject research can be successfully managed. Likewise, many FCOIs that involve human subject research that entails no more than minimal risk to subjects (as determined by the IRB) can be successfully managed.

When an FCOI involves a significant financial interest and research that entails more than minimal risk to human subjects, a compelling justification is required in order for the arrangement to be successfully managed. More detailed information regarding FCOIs is available at web.jhu.edu/



[conflict_of_interest/overview_of_policies](#)

Putting Policy Into Practice

The following guidance applies in proposed arrangements that involve IP, private consulting or advising, and/or faculty startups.

This guidance is not intended to replace full consideration of the policies outlined above, but it can be referenced as a general summary of steps to follow when entering into these types of endeavors.

You developed an invention at Johns Hopkins, and you want to protect it:

Report the discovery to JHTV so that it can be analyzed to see if the discovery merits obtaining intellectual property protection (such as a patent application, trademarks or copyrights).

You want to consult or advise a company under a private agreement:

If the company is your startup, see the information below. Otherwise, disclose the proposed consulting or advising work in eDisclose (web.jhu.edu/conflict_of_interest/eDisclose). The online disclosure form requires, among other things, the following information:

- » Brief description of the consulting or advising work, which should be separate and distinct from your responsibilities at Johns Hopkins
- » Proposed time commitment and any compensation
- » Any related research projects and/or protocols
- » Any IP you invented that the company has licensed/optioned or intends to license/option

You developed an IP at Johns Hopkins, and a company wants to option or license it:

If the company is your startup, see the information below. Otherwise, disclose your

role as an inventor of the IP in eDisclose (edisdisclose.jhu.edu). The online disclosure form requires, among other things, the following information:

- » The IP you invented that the company has licensed/optioned or intends to license/option
- » Any related research projects and/or protocols

You want to create a startup:

You are required to disclose the proposed arrangement for review in eDisclose. However, if you have questions about the disclosure and/or FCOI review process with respect to a faculty-created startup, you are encouraged to first contact staff in the school of your primary affiliation for guidance. Contact information is available at web.jhu.edu/conflict_of_interest/contact_us.

Disclose the proposed arrangement in eDisclose (edisdisclose.jhu.edu). The online disclosure form requires, among other things, the following information:

- » Your intended role in the startup (for example, consultant or adviser, board member, officer, etc.)
- » Proposed time commitment
- » Equity, stock/stock options or other ownership interest
- » Any related research projects and/or protocols (include both current and anticipated research)
- » Any IP you invented that the startup intends to license/option

The following additional information is often helpful and should also be provided, if possible:

- » Intended field and purpose of the startup
- » Approximate amount of any venture capital or other funding the startup has received or anticipates it will receive in the near future
- » SBIR/STTR or other grant applications the startup intends to submit
- » Anticipated location of the startup



Frequently Asked Questions About the JHU Intellectual Property Policy

Faculty often have questions about the JHU Intellectual Property Policy (“IP Policy”). Here are some general answers to commonly asked questions. These FAQs do not replace or supersede the IP Policy, which is available here: ventures.jhu.edu/the-johns-hopkins-ip-policy.

Who owns what I create?

The Johns Hopkins University owns all rights, title and interest to intellectual property developed with support directly from or channeled through the university. “Support” is defined as financial or other support, regardless of origin, which is used in the discovery or development of intellectual property and is provided through university channels. Support includes (but is not limited to) access to facilities, equipment, salary support from the university and other sources, and administrative support. In the absence of such support, rights of ownership of intellectual property remain with the inventor.

Johns Hopkins Technology Ventures has decided not to license my technology. Can I take ownership of the IP?

The university may, in its sole discretion, transfer any rights of ownership by assignment or otherwise to the inventor after a determination that it is appropriate to do so.

Johns Hopkins has given me the rights to my IP through an assignment of rights document. Am I free to do with it as I please?

Any continued work on the IP is subject to Johns Hopkins’ policies, including its conflict of interest and conflict of commitment policies. Researchers who own certain IP rights still have an obligation to report any outside activities and interests related to their teaching, research or service to their department and must obtain prior approval before beginning any activity. Faculty are prohibited from conducting research outside of the university.

Additional obligations directly related to the IP may also exist, including government reporting requirements under the Bayh-Dole Act or other third-party obligations.

Can a student contribute to an invention?

Yes, undergraduate and graduate students are often inventors. The ownership of an invention solely developed by a student depends in part on what capacity the student is operating. In general students who created IP during a Johns Hopkins course own their contribution to any IP, whereas students who create IP while working in a faculty member's lab (paid or unpaid) do not.

For more information about students and IP rights, visit: ventures.jhu.edu/wp-content/uploads/2019/03/Students-and-IP-FAQs.pdf.





FAQ

Does JHTV give any special consideration to inventor startups when selecting a licensee?

The FastForward team at JHTV provides coaching, mentorship and discounted office and lab space to inventor startups that license Johns Hopkins technologies.

It is a significant advantage for a startup to have the inventor as a cofounder or scientific advisor, as the inventor is uniquely positioned to contribute to the development of the technology and can credibly articulate and champion the technology. However, JHTV is always cognizant of its mission to ensure that the licensee chosen is the one with the best chance to bring the technology forward. License negotiations and agreements with inventor startups must fall within the normal range of terms and conditions of similar licenses to non-inventor-associated companies.

When can startup management negotiate a license?

Startup management can negotiate a license when it has the legal ability to enter the startup into an option or license with the university. When a faculty member creates a startup, he/she may not negotiate with the university on behalf of the company. Faculty/inventors are encouraged to identify a business representative (such as an entrepreneur or attorney) to conduct this activity. While doing this may be considered a “loss of control” for some faculty, the experience, attitude and focus of a business representative pays dividends in the speed and efficiency of closing a license transaction and having a final agreement that is comprehensive and thoughtful. JHTV offers an express license for startups to reduce the cost and time of negotiation.

What is an option, and can a startup take that instead of a full license?

An option is a time-limited period of exclusivity during which The Johns Hopkins University will negotiate only with the optionee for a license, generally six to 12 months. In consideration for this exclusive period, the optionee will pay an option fee and patent expenses. An option agreement instead of a license agreement is sometimes preferred for startups, as it preserves cash while empowering the pursuit of investors.

How long does it take to license a technology from JHTV?

This depends on the type of technology, with patent licenses requiring more time and diligence than tangible material licenses. JHTV has made an effort to design a straightforward license to reduce negotiating time and legal expenses.

What are typical licensing terms for Johns Hopkins' agreements with startup companies?

The Johns Hopkins University may grant a startup the ability to make, have made, use, sell or offer to sell a licensed technology; the ability to sublicense; and the ability to take legal action against infringers. Licenses can be exclusive or nonexclusive, and royalty rates are typically higher for exclusive licenses. In exchange for this grant, a startup licensee may agree to provide upfront consideration, midstream milestone payments, and downstream royalties. The startup will agree to diligently pursue commercialization and indemnify The Johns Hopkins University against any liabilities.

Key issues for The Johns Hopkins University in structuring license agreements include: diligence milestones that ensure development of a technology to a product; protection of the university from liability through robust insurance, indemnification and no warranty clauses; and financial returns to the university that are in line with established norms (such as the Licensing Executives Society's annual royalty survey).

JHTV expects licensees to cover the cost of ongoing patent prosecution. While Johns Hopkins University license agreements often have JHTV

fronting the cost of patent expenses, the licensee is expected to reimburse JHTV for those expenses in a timely manner. JHTV can also structure direct billing arrangements between licensees and law firms whereby the company has more direct control of prosecution activities and responsibility for expenses.

Does the university take equity in startups?

Yes, both in the form of equity and convertible debt (a loan that can turn into equity).

An area where the entrepreneur and university are operating without key information is in the value of startup equity. While percentage terms are often negotiated (e.g., 5 percent equity as upfront license consideration), the value of the equity is not known by either entrepreneurs or JHTV. Rather than get overly focused on percentages that may or may not have any value (100 percent of \$0 is \$0), entrepreneurs are encouraged to develop an understanding of the value of their business (See page 22 - [The IP Marketing Blog Offers 10 Tips for Startup Valuation](#)). With this understanding, a true valuation of a deal can occur, to the benefit of both the startup and the university.

How does JHTV manage the equity granted as part of a license agreement?

JHTV will hold the equity in the startup company until the first opportunity for liquidation (selling equity shares for cash). If/when a liquidation event occurs, JHTV will distribute the proceeds according to the IP policy (ventures.jhu.edu/the-johns-hopkins-ip-policy).

Does a Johns Hopkins representative take a seat on the company board?

Sometimes Johns Hopkins requests an observer seat.

Will Johns Hopkins assign (transfer ownership rather than the right to commercialize) the patent to a startup (or existing company)?

No. For discoveries created with federal funds (such as NIH grants), the university is precluded from assigning patents to private entities. Despite

this, any company that licenses Johns Hopkins University technology can be assured that the license agreement fully confers to the company the patent rights that it needs to be successful, including the ability to make and sell products, sublicense to others and pursue infringers.

Can a startup get a license without being incorporated?

No. A startup entity should be incorporated not only to get a license but also to conduct the activities of any business and reduce liability to the company founders.

If the startup is based on an invention jointly-owned by Johns Hopkins and another institution, what happens to the invention?

An interinstitutional agreement between The Johns Hopkins University and the other institution(s) will govern who takes the lead on licensing and the percentage split of revenues and expenses between the two. The Johns Hopkins University regularly negotiates interinstitutional agreement, so this will not be a barrier to a license.

If a startup needs technology from an institution outside of the Johns Hopkins University and the technology is not jointly owned with the university, will the company need a separate license?

Yes.

If the invention is unpatented software, will the startup still need a license?

Yes. Software (including mobile applications) and other tangible materials are considered the intellectual property of The Johns Hopkins University pursuant to the IP Policy (jhu.edu/university-policies).



HELPFUL RESOURCES

JHU Conflict of Interest School-Specific Contact Information

Bloomberg School of Public Health

Miye Schakne

mschakne@jhu.edu | 410-502-0433

Krieger School of Arts and Sciences

Laura M. Evans, M.A., C.I.P.

levans22@jhu.edu | 410-516-4820

School of Medicine

Office of Policy Coordination

policy@jhmi.edu | 410-361-8667

School of Nursing

SON-Innovation@jhu.edu | 410-502-3685

Whiting School of Engineering

Laura M. Evans, M.A., C.I.P.

levans22@jhu.edu | 410-516-4820

Carey Business School

Toni Cheeks-Shaw

tcshaw@jhu.edu | 410-234-9299

Other Useful Links & Contact Information

- » DC I-Corps: dcicorps.org » Department of Energy: arpa-e-foa.energy.gov
- » JHTV invention disclosure process: tpreston26@jhmi.edu | 410-955-7290
- » JHTV's researcher portal: jhu.inteum.com/jhu/inventorportal/
- » JHU conflict of interest: web.jhu.edu/conflict_of_interest/contact_us
- » JHU disclosure requirements by affiliation/role: web.jhu.edu/conflict_of_interest/disclosure_requirements
- » JHU eDisclose overview: web.jhu.edu/conflict_of_interest/eDisclose
- » JHU eDisclose: edisclose.jhu.edu
- » JHU FCOIs overview: web.jhu.edu/conflict_of_interest/overview_of_policies
- » JHU IP Policy: ventures.jhu.edu/the-johns-hopkins-ip-policy
- » JHU policies and statements: jhu.edu/university-policies
- » JHU policies on disclosure and professional commitment/conflict of commitment and conflict of interest: web.jhu.edu/conflict_of_interest/JHU_Policies
- » SBIR/STTR: sbir.gov » TEDCO: tedco.md
- » Translational funding opportunities: ventures.jhu.edu/find-translational-funding

Investment Presentation Guide

Pitching investors is an essential part of the startup success. However, a template for the perfect slide deck does not exist. Along your startup journey, you will certainly receive conflicting advice with both sides seeming equally compelling and credible. The following pages serve as a guide and may help you make the best adjustments for your startup. Always remember, potential investors will study your deck; this means honesty is the best policy.

POINTS TO REMEMBER

- » **Simpler is better.** Present one idea or image per slide.
- » Include date and page numbers on every slide except for the cover.
- » Each page should have an informative/descriptive title, nothing generic.
- » Insert your logo as a header or footer on every slide.
- » Prominently indicate which slides contain confidential information.
- » For security and formatting reasons, send presentations as a PDF. However, bring your original file to the event for unexpected last-minute changes.
- » You have the greatest attention from your audience in the first 60 seconds. Do not waste it.

Cover page: Tell the investor who you are and why they should remember you.

- » Include a tagline—one sentence or phrase that captures how you want to be known.
- » Include your organization's name, logo and slogan (if you have one), and your name, title and contact info.

Executive summary: Capitalize on the first 60 seconds when you have maximum investor attention by concisely telling investors why you are a compelling investment opportunity.

- » Start with your investment thesis, i.e., the few major points that make your investment proposition appealing. This includes the opportunity/problem, your solution (value proposition), and what makes it compelling.
- » You should aim to heighten interest in a concise fashion, **NOT** to tell the whole story.
- » The rest of the presentation will support these claims in a logical, supportive fashion.

Opportunity or problem: Tell investors about the potential to make money.

- » What is the opportunity/problem that you are addressing?
- » Don't give unrealistic total available market projections.
- » Define the market you are going after—incidences, procedures, dollars spent and the **REASONABLE** percentage you can obtain.
- » If possible, show actual results and let the investors extrapolate for you.

Solution: Tell investors that you have something that exploits the opportunity or solves the problem(s) above.

- » What is your value proposition?
- » What problem(s) are you solving?
- » What opportunities are you creating?
- » They should match the opportunities/problems cited above. Product features are NOT value propositions, though they do help to deliver them.
- » If possible, show actual results/data.

24-Month action plan: Tell investors what you need to do and identify risks.

- » What is your action plan and critical path—research milestones, product development, regulatory, other?
- » What resources do you need to put in place—capital, management, technical, other?

- » Identify risks and state how you plan to address them.
- » Be clear and decisive.

Business model: Tell investors you can make money doing the above—hopefully lots of money.

- » How do you plan to generate revenue and profit?
- » How will you capture value?
- » Focus on one segment and revenue stream.
- » If you have legitimate long-term opportunities, mention them at the end of your 24-month action plan as areas for exploration.
- » Focus on the metrics that matter in driving the business and creating value.

Competitive analysis: Tell investors why you are better and can succeed against long odds.

- » What are the key success factors and metrics as defined by users and purchasers?
- » How do you compare against others? A table format is preferable when doing so.
- » Express your competitive advantages clearly and concisely.
- » Pictures, diagrams and prototypes are worth a thousand words each.

Financial forecast & use of funds: Tell investors what you are going to do with their money over a specific time period.

- » Amount of financing sought
- » Planned uses and milestones that match your 24-month action plan
- » Planned sources
- » Funding and sources to date, including significant grant or philanthropic funding, to establish credibility

Management team: Tell investors why they should partner with you.

- » Background of key executives, advisors and investors

Summary slide: Remind investors why your proposition is a compelling investment opportunity.

- » Repeat the investment thesis and value proposition or the few major points you want remembered.
- » Leave this slide up during Q&A. Save “Thank-you’s” for when you are walking out the door.

Appendix: Provide structured answers and data to address likely objections and technical questions.

- » Slides should provide additional information or address significant risk factors.
- » Your ultimate goal is to have a comprehensive slide deck from which you can easily extract shorter versions to match presentation objectives and duration.

FIVE BASIC PRESENTATIONS

- » **30 second elevator pitch:** opportunity, solution, competitive advantage, compelling business model
- » **Seven slide pitch:** five minutes or less
- » **10-15 slide presentation:** 10-15 minutes
- » **15-30 slide presentation:** 30 minutes
- » **30-50 slide detailed presentation:** 30-60 minutes



USE OF THE JOHNS HOPKINS NAME

The name of The Johns Hopkins University or Johns Hopkins Health System or any of its constituent parts, such as The Johns Hopkins Hospital, Johns Hopkins Medicine or any contraction thereof or the name of innovators in any advertising, promotional literature, websites, electronic media applications, sales literature, fundraising documents, or press releases and other print or electronic communications shall not be used for any purpose without prior written consent from an authorized representative of The Johns Hopkins University. Any request to make use of such names shall be made at least seven business days' in advance of any proposed use and may be made by written request through JHTV.

If you have questions, please see the information at brand.jhu.edu/use-of-name or consult a member of the FastForward or JHTV staffs.



Checklist for Faculty Inventors

- ☐ Validate technology and market through I-Corps/Lean startup program.
- ☐ Fulfill obligations at given school for conflicts of interest disclosure.
- ☐ Identify outside entrepreneur to work in partnership with faculty and handle business matters of the new company (“newco”).
- ☐ Identify board/business advisers to guide company.
- ☐ Negotiate ownership and codify this ownership structure in a capitalization table with the entrepreneur and advisers.
- ☐ Incorporate new company using pro bono legal resources from FastForward as appropriate.
- ☐ Ensure sufficient capital exists from founding investors to cover accumulated patent expense, which must be reimbursed to The Johns Hopkins University upon completion of license or option. (Additionally, all future patent expense related to the licensed IP is the responsibility of the newco, so ensuring adequate resources for IP protection is a key part of the financing strategy.)
- ☐ License technology from The Johns Hopkins University.
- ☐ Identify name, purchase URL and consider logo.
- ☐ Purchase insurance for newco.
- ☐ Create a *pitch deck* to explain business concepts, plan, team, etc.
- ☐ Create business plan for go-to-market strategy.
- ☐ Raise nondilutive or investment dollars for the new startup/company.





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The 7 Questions

A guide to solidifying the commercial value of an invention

When a researcher believes a discovery could be turned into a commercial product or service, the first step is report of invention to the university. In this process, Johns Hopkins Technology Ventures seeks all perspectives of the researcher in order to determine whether the technology is a good candidate for licensing. Therefore, before making report of invention, researchers are asked to consider the following **7 Questions of Commercial Value** in order to assist JHTV's licensing team.

Problem Statement and Unmet Need

1. What problem does this invention solve?
2. What is the size of the unmet need?

Value Proposition of the Advance

3. What product do you envision as a result of this technology, and would this be a marginal or groundbreaking improvement to current technology?

Customer

4. What type of company might license this technology? (Provide any specific companies.)
5. Who would be the end-user of a product using this invention?

Capital

6. How much funding has been invested in the invention to-date?

Milestones

7. What is the current stage of development and what further work is required, if any, to make this technology a candidate for commercialization or industry collaboration?

OTHER ASPECTS OF COMMERCIALIZATION TO CONSIDER

- **Invest-ability:** How much capital will be required to take the product to market? What evidence exists about the invest-ability of this technology?
- **Competition:** With what would this technology – or company – be competing? What will make the product/service resulting from this technology unique?

Ready to report your invention? Visit ventures.jhu.edu/disclosure

THE 7 QUESTIONS OF COMMERCIAL VALUE EXAMPLE:

The implantable cardiac defibrillator (ICD)

Problem Statement and Unmet Need

What problem does this invention solve? What is the size of the unmet need?

Approximately 325,000 people in the United States - and 7 million worldwide - die from sudden cardiac death each year. The condition usually results from an electrical disturbance in the heart and is often undiagnosed.

Value Proposition of the Advance

What product do you envision as a result of this technology, and would this be a marginal or groundbreaking improvement to current technology?

A small, implantable device will shock patients when they experience tachycardia (abnormally fast heart rhythm), preventing cardiac arrest. External defibrillators, by contrast, are bulky and carry the risk of infection at the entry point; drugs exist that control heart rhythm but are not of use in acute or previously diagnosed situations.

Customer

What type of company might license this technology? Who would be the end-user of a product using this invention?

Major medical device companies would see huge value in developing and selling this product. The patient is the ultimate end-user. Hospitals would purchase the ICDs for implantation and cardiologists will perform the procedure.

Capital

How much funding has been invested in the invention?

Research into the ICD began in 1969 but the first patent related to the device was not issued until 1980. After years of development, testing and investment in intellectual property, the device was first implanted in a human in 1980 at The Johns Hopkins Hospital.

Milestones

What is the current stage of development and what further work is required, if any, to make this technology a candidate for commercialization or industry collaboration?

The ICD itself had to be tested for battery life, software compatibility and wire function in humans. It also underwent multiple clinical trials, most notably the Multicenter Automatic Defibrillator Implantation Trial, which involved 1,200 patients at hospitals around the world.

The FDA approved the device in 1985. Today, more than 250,000 ICDs are implanted each year, and the devices have proven to be 99 percent effective. The devices sell for \$30,000 each.

Ready to report your invention? Visit ventures.jhu.edu/disclosure



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Dilution of startup equity

Startup investments are considerably more risky than investments in established businesses. Consequently, in exchange for providing early capital, startup investors typically expect a portion of the business – or “equity,” partial ownership in the company – in return.

Over time, as startups continue to raise “rounds” of capital, existing shareholders’ ownership in a startup decreases as new shares are issued. This is known as **equity dilution**.

The table below shows an example of equity dilution. In this case, the founders initially own 100 percent of the company. As the company attracts more investors, however, the founders’ equity drops to 20 percent.

Group	Pre-Seed	Post-Seed	Post-Series A	Post-Series B
Founders	100%	85%	30%	20%
Seed Investors		15%	10%	5%
Series A Investors			50%	31.3%
Series B Investors				31.3%
Option Pool			10%	12.3%
Total	100%	100%	100%	100%

Founder Share

Because of dilution, founders of university startups may feel as though their contribution is diminished or devalued over time. (*This company would be nothing without my technology!*) Indeed, ceding equity in a company can feel like a loss of control and financial interest. In fact, while founders’ percentage of total ownership may decline, the value of the founders’ stake may increase as the company grows and as investors provide capital.

Founders also commonly remain involved in the company by providing critical input into the strategic and scientific activities of the company. A founder who is a faculty member can be a top executive in the startup provided there is a corresponding reduction of university responsibilities and a division-approved management plan.

University Share

Johns Hopkins University can take equity in startups as well as convertible debt (a loan that can turn into equity). This percentage is negotiated during the licensing process (e.g., 5 percent equity might be issued to the university as an upfront license consideration). The value of the equity is initially theoretical and depends on assumptions made about the business. Rather than get overly focused on percentages that may or may not have any value (100 percent of \$0 is \$0, after all), entrepreneurs are encouraged to develop an understanding of the value of their business. A true valuation can help the startup and the university have an informed negotiation.

JHTV will hold equity in the startup until the first opportunity for liquidation (selling equity shares for cash). If/when a liquidation event occurs, JHTV will distribute the proceeds according to the university's IP policy. See the chart below. (Note: The inventors' personal share takes into account all inventors. That is, if four people are credited as inventors, the 35 percent share is divided four ways.)

Annual Net Revenue	Inventors' Personal Share	Inventors' Research Share	Inventors' Dept(s)* Share	School Share*	University Share
First \$300K	35%	15%	15%	30%	5%
Over \$300K	35%	15%	15%	25%	10%

For more information, please see The Johns Hopkins University's IP policy:
ventures.jhu.edu/the-johns-hopkins-ip-policy



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Funding Your Research

Translational funding enables Johns Hopkins inventors to move early research towards commercialization. Funding can come from a variety of sources, including federal and state programs as well as a set of philanthropic grant programs established specifically for Johns Hopkins innovators and managed by Johns Hopkins Technology Ventures.

The funding often is non-dilutive, meaning the financing does not require equity in exchange for the money. Inventors should consider such options before turning to other forms of investment funding.

Translational Funding Sources

1. University commercialization funds

Friends of Johns Hopkins who value economic development and commercialization of technology have provided funds to help move startups from concept to incorporation. These grants tend to focus on early stage research and ideas that require advancement to reach a point where the technology can be licensed or a startup formed. For up-to-date information on grant cycles and application deadlines, please visit ventures.jhu.edu/find-translational-funding.

The Louis B. Thalheimer Fund for Translational Research

Size: \$25,000-\$100,000

Length of Project: Up to nine months

Application Deadline: Annually on March 15

Eligibility: Johns Hopkins faculty members; technology without existing licenses

JHU Contact: Brian Stansky (bstansky@jhu.edu)

The Cohen Translational Engineering Fund

Size: \$20,000 – \$40,000

Length of Project: Up to four months

Application Deadline: Up to three times a year – Oct. 15, March 15 and May 15

Eligibility: Faculty members from the Whiting School of Engineering with pre-company technology

JHU Contact: Ben Gibson (bgibson@jhu.edu)

The Bisciotti Foundation Translational Fund

Size: \$25,000-\$100,000

Length of Project: Up to nine months

Application Deadline: Annually on October 15

Eligibility: At least one investigator must be a faculty, post-doctoral fellow or graduate student at Johns Hopkins; technology without existing licenses

JHU Contact: Brian Stansky (bstansky@jhu.edu)

2. State of Maryland Funds

The state of Maryland provides different types of technology development and startup funding through the Technology Development Corporation of Maryland (TEDCO). The Maryland Innovation Initiative, in particular, has funded over 120 JHU projects since 2012.

Maryland Innovation Initiative (MII)

Size: Up to \$265,000 through two phases of the program

Length of Project: Technology Validation and Market Assessment, 9 months; Commercial Launch, 9 months

Eligibility: Inventor must have licensed technologies from Hopkins and be located in Maryland

Contact: Arti Santhanam, Director of the Maryland Innovation Initiative (asanthanam@tedco.md)

3. Industry-sponsored research

Sponsored research from industry supports Johns Hopkins faculty through collaborations that can leverage the strengths of both academia and industry and bridge the gap between early scientific discovery and its translation into new products.

These relationships, which JHTV actively facilitates through its Corporate Partnerships team, typically provide researchers with funding and access to the industry collaborator's development expertise.

JHTV has partnerships with AbbVie, Bayer, GSK, Janssen, MedImmune, Pfizer and Toshiba/Cannon, among other companies.

For more information, email Helen Montag, Senior Director of Corporate Partnerships (hmontag@jhu.edu).



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