



Strategic Plan Development

Prepared for:
US FLN Leadership

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I. Introduction

The Public Services Institute (PSI) of Lorain County Community College conducted a total of 70 in-depth interviews (IDI's) with individuals associated with Fab Labs across the United States. The overall intent was to inform the development of a strategic plan for the newly created U.S. Fab Lab Network. In addition to in-depth interviews, a survey was administered to prioritize key statements derived from content analysis of interviews. The interviews and prioritization process informed the development of a mission statement, vision statement, set of core values and strategic priorities or goals for the Network. The strategic plan will be refined in April 2012 at the annual Network meeting.

Familiarity with the US Fab Lab Network		
Familiar	40	66.60%
Somewhat familiar	13	21.60%
Not Familiar	7	11.60%

When did you become aware of the Network?		
Less than a year	5	8.30%
1 to 2 years	13	21.60%
3 to 5 years	13	21.60%
More than 5 years	5	8.30%

Which of the following best describes your association with Fab Labs?

	Number	Percent
Community-Based Fab Lab	10	14.0%
Community, Education, Industry	4	5.6%
Education-Based Fab Lab	39	55.0%
Education, Industry	3	4.2%
Business/Industry-based Lab	2	2.8%
Non-profit (e.g., a Museum)	6	8.2%
Other*	7	11.2%
<i>*Other, included a "a combination of these," National Science Foundation and Consultant to a variety of Fab Labs specializing in those in developing countries.</i>		

Map of respondent zip codes across US



II. Key Themes Resulting From In-Depth Interviews

A. SWOT Analysis

1. Strengths

Contribution of Fab Labs To Date

- Education / workforce development
 - “Educating students”
 - “Hands on approach to learning”
 - “Allows self directed learning”
 - “Re-integration of hands on learning into science and engineering curricula”
 - “Fab labs have provided a venue that gives hands-on, project based, innovation a good name”
 - “Bringing together multiple disciplines at the college level – engineering, business, science, arts, humanities, etc”; “Breaking down silos along discipline and program areas of study for colleges – theater, art, engineering, and others working on projects together”; “The change from a silo operation in schools to a holistic one”
 - “Energizes a cross-section of teachers from different disciplines to get students excited”
 - “Opportunity for students – both secondary and college level – to express creativity in interdisciplinary ways with artists, technicians, engineering all fused together”
 - “Team work – learning from what others are doing”; “Problem solving approach to learning”
 - Design opportunities for STEM students
 - “Getting young kids – as young as 7 – to be creative – empower them. Exposing kids who could not afford to do this to fab lab summer camps. Active, hands on learners get an outlet. Young kids are starting small businesses, getting jobs in early stages”
 - “Increases participation in learning science”
 - “Encourages workforce development in engineering. Teachers and students participate in engineering design process and learn about career opportunities early on”
 - “Helps kids understand product development at an early age”
 - “Number one is the awareness that math, science, engineering are all related and can be fun”
 - “Expands educational opportunities to people who previously were not reached, including kids”
 - “Provides a way to reach a whole different set of students”
 - “Way to use digital fabrication in the classroom”
 - “Unlocking student creativity and preparing them for jobs”
 - “Having young people realize they can make things”
 - “Students who lack core skills are provided an environment where they can experiment”
 - “Opened up a way to make connections between science, technology, and the real world”
 - “Access to kids to create and innovate – help them understand project-based learning – makes learning fun”
- Economic development through entrepreneurship / invention
 - “When people come together in Fab Labs, their wheels start spinning with creativity”
 - “Provides entrepreneur and small business opportunities for local communities”
 - “Opportunity to cost-effectively prototype a variety of new products and business applications”
 - “Creative application of technology”
 - “Expand knowledge base of inventing”
 - “Opportunity to modernize and find local solutions to real issues”
 - “Provides ability to create, short run production of objects for every day use”
 - “Fab Labs are solving real world problems. In India, a device was designed and built to test the quality of milk brought to market and that device is still in use several years later”
 - “Is a place for small and medium size companies to have a place to do R&D in the market”
 - “Helping those without technical skills or availability of technology to get products to market”
 - “In third world countries has helped develop infrastructure”
 - “The ability to generate fast paced electronics, come up with a way to build quickly, to replicate the fast production process”
 - “Inspiring people at the local level from many different countries to become amateur inventors”

- Local community and public access to technology / individual empowerment
 - “Introduction of new digital machines to the public”
 - “Put technology in the hands of people with different backgrounds who would not normally have that access”
 - “Opportunity to the general population they have never had before”
 - “It is about individual empowerment”
 - “Opportunity to communities through access to technology they would not ordinarily have”
 - “Open source to access”
 - “Round the world access including third world countries”
 - “Access to equipment”
 - “Democratized technology – made things available to the public that they wouldn’t have had access to”
 - “Is a focal point in the community for people to meet and learn from one another”
 - “Energizes a community to see possibilities”
 - “Accessibility of equipment”
 - “Access to technology among ordinary people”
 - “Empowering people to realize their ideas and to engage in a global community of technology and makers”
 - “They bring community together with industry”
 - “Break down barriers – cut across age, discipline, and socio-economics – provide an opportunity for engagement in learning new things and the ‘ow-wow’ experience for adults and children”
 - “Provide people the opportunity to realize they can solve their own problems physically not just mentally or intellectually”
 - “Provides a resource to the general public”
 - “Enabling the general public to use manufacturing helps strengthen technology”
 - “Bring technology to people who don’t have access to it”
 - “Galvanizing people and communities to come together to think in new ways to solve problems”
- Creating a professional network of Fab Lab industry related to the maker industry
 - “Fab labs created a network of people who are related and interested in the fab lab industry”
 - It is relating people to the maker industry
 - “The collaboration – connectivity domestically and internationally”
 - “Creating a fab lab community”
- Other
 - “The ability to fail and realize you cannot really fail or that you did not do it right but you’re not done and can keep going”
 - “Is incredible experimentation”
 - “Comradery among community colleges and their communities (community at large, K-12, entrepreneurs)”

Uniqueness of Fab Labs

- Open Access at Grassroots Level
 - “Open access to machines and experimentation”
 - “The equipment that is available – open access”
 - “Openness to community”
 - “Availability to the community”
 - “It is open access so there are not as many barriers for people to use technology”
 - “Spread out across the nation and each Fab Lab has the capability of customizing to the needs of the area, client, goals”
 - “Grass roots approach”
 - “Social as opposed to commercial orientation – are about people not profit”
 - “Accessibility to the community”
 - “Accessibility to all kinds of people”
 - “Fab labs are unique because they are so open to the general public”
 - “Provide access, exposure, opportunity for people to use technology”
 - “Not discipline specific, not exclusive”
 - “It’s open source”

- “Considered a grass roots phenomenon in FL”
- Developing an Entrepreneurial Culture/Different Way of Thinking
 - “Working its way into the culture at large – it is the second half of a revolution that started in 1950”
 - “Brings garages to the public”
 - “Building a community of practice that will continue to increase impact”
 - “Inspires creative work”
 - “WOW factor – creates a different way of thinking for each person”
- Bringing Unique Groups of People Together
 - “Ability to integrate into a number of different communities – academic, business, community at large – all can be served”
 - “Developing groups of people who are thinking about innovation in a different way with different resources capability”
 - “Diversity of people interested in them, not just engineers and scientists. Few people find them interesting, everyone gets pulled into the enthusiasm”
 - “Providing a space for innovators, artists, engineers and others to come together”
 - “Creating opportunity for people to network together to learn from each other – allows many to participate in design and problem solving”
 - “Group exploration across the world that we humans can do faster/better”
 - “Fab labs are integrative – put specialties into broader context; cross pollination of disciplines”
 - “Transcends age, gender, socioeconomic, educational backgrounds – is a technological playground for all”
 - “So many people together across age, class, language, discipline, culture – artists working with scientists”
 - “It is the human element – it is not like a business. People are willing to help each other – like a different culture – amazing to look at people finding out they can do what they never thought they could do”
- Experimentation to Make New Things
 - “Getting students who might not otherwise be interested in making things”
 - “Having machines all in the same room allows people to combine different technologies to make something”
 - “Orientation towards experimentation – prototyping to explore and make new things”
 - “People can see direct results of their work – it puts a physical object in their hands that they have created”
 - “Having access to equipment that is easy to use, students can see the results very quickly”
 - “Centralized location for hands on experiences”
 - “Love the MIT concept – build whatever you want”
 - “Affordable technology, professional results, high quality product development”
 - “Ability to readily make things – rapid prototyping”
- Networking
 - “Networking is unique to Fab Labs”
 - “The network of Fab Labs that share curriculum and materials”
 - “Philosophy of Fab Labs – open labs, sharing of ideas all around the world”
 - “An open network and is collaborating internationally”
 - “The international network and cooperation within this network”
 - “The MIT connection – collaboration – getting together and sharing”
 - “It’s a network, there are some consistencies across fab labs across the world”
 - “Worldwide network for collaboration”

Importance of a US Fab Lab Network

- Idea and Information Exchange
 - “Synergy among players in the network will create products and opportunities for innovation and new ways of thinking”
 - “Simply learning faster”
 - “Real life sharing”
 - “Take advantages of resources anywhere – access to the best minds everywhere”

- “Sharing ideas, ability to ask questions”
- “Good to have others who have been there done that”
- “Enables sharing and collaboration of ideas”
- “Share ideas about how to use equipment creatively, different users, solutions to problems”
- “It is a do-it-yourself community that isn’t looking for leadership but there are areas where it is helpful for the maker community to come together”
- “Sharing of knowledge”
- “Chance to talk with Fab Labs around the world who have different users”
- “Can share ideas, you build off each other – two heads better than one”
- “Are many experts who have been using labs for a long time – a wealth of information and experience”
- “Beneficial to learn from each other”
- “Exchange of ideas and information”
- “Open communications and willing sharing encourages reciprocity and generosity”
- “Best practice sharing about how to make fab lab work in different communities, with different populations”
- “Ability to think outside the box beyond convention will come from places like India where different backgrounds and ability to innovate can be shared”
- Builds Credibility for Purposes of Marketing & Funding
 - “Common voice for purposes of marketing regionally and nationally”
 - “Generates awareness of organizations”
 - “Share marketing and publishing strategies”
 - “Gives more credibility for marketing/funding”
 - “Collaborative funding opportunities – grants, subsidies, government programs”
- Sharing of results/accomplishments
 - “Share results as we go”
 - “Share success stories”
- Collaborative Projects/Connectivity among Labs.
 - “Collaboration is important. Could link 5 or 6 locations who start with a design concept, collaborate on it and gauge reactions among each other – benefit from diversity of view points on design concepts”
 - “Actually look at projects – need direct communication with multiple labs at once k- split screen into four different time zones to connect lab directors and users – show and tell”
 - “If we can get fab labs on a network it is a giant manufacturing facility – would completely change manufacturing”
 - “Share completed designs nationally”
 - “Keep an eye on US developments”
 - “It fosters collaboration – gives strength, rich depth, experience and ideas”
- Developmental of Educational Standards/Advocacy
 - “Help establish K-12 standards like instructional standards for STEM at high school level”
 - “Common store of template class materials”
 - “Link STEM instruction to real world application”
 - “A USFLN is important to help engage domestic labs on national issues like STEM education”
 - “Real opportunity to advance science and technology to increase STEM education – be a part of the conversation at the policy level”
 - “Sharing of curriculum has been big with the Midwest consortium”
 - “The educational system is not working – media and technology move too fast and the educational system can’t keep up; school is boring - fab labs fill in what is missing: learning from making! – people don’t want to see it online, they want to do it, make it”
 - “Help fill skilled jobs in today’s market”
 - “Provide technical support to teachers”
- Build Standards for Fab Labs
 - “Standardization of labs”
 - “Standardize processes and equipment”
- Coordinating body/facilitator needed
 - “Need someone to coordinate among labs”

- “Someone has to take responsibility for meetings and to coordinate or hold the network together and facilitate communication”
- “Is important to have some kind of facilitator among networks to enable information sharing
- Connect with the International Fab Lab Association

Greatest Accomplishments of Newly Formed USFLN

Approximately 47% were not aware of the newly formed US Fab Lab Network or new it existed but had limited information about the network and could not comment on its greatest accomplishments or the ways in which it has helped them. Among those who were familiar, the greatest accomplishments cited were as follows:

- Fab Lab Start Up
 - Helping people get started with labs
 - “Has given me a platform for thinking about how we want to move this forward in our community among existing partners and prospective partners”
 - “Sent information from MIT and a comprehensive guide to equipping and operating a Fab Lab”
 - “The way they progressively push for new labs all over the US is very important. They helped me out tremendously when I first got started with advice and information”
 - “Better understanding of the US Fab Lab Network and ecosystem and environments they operate in”
 - “Provided a lot of information and advice. Helped us put together a business plan and who to start calling”
 - “Giving context in which people can evaluate their own Fab Labs”
 - “How to get started; enjoyed the company because I had been at it for more than a year”
- Networking and Communications
 - “I like the newsletter which is a new feature”
 - “Networking and communication”
 - “Benefit has been to network and interrelate with other Fab Labs”
 - “When I think of the Network, I think of the people I work with at the University of Virginia and University of Hawaii. I can call on the expertise of people I’ve met over the past 2 years so we can collaborate on future projects”
 - “Marketing and advocacy of Fab Lab”
 - “Has provided a centralized location where information is located”
 - “Conferences – we are currently collaborating with an individual we met in Kansas City - even though we are only 10 miles from each other we didn’t know about each other before and didn’t collaborate”
 - “Annual symposiums are an accomplishment; webinar series is very useful – USFLN has inspired me and keeps my inspiration going. When I slow down, when passion goes down, the network reenergizes me”
 - “Good idea to have webinars”
- National & International Visibility
 - “Bringing the symposium to Kansas City. Has achieved visibility, has given us a voice in the international community”
 - “More of a visible presence in D.C. related to STEM – it’s more widely known”
 - “Global connection is important”
- Other
 - “Will give me another tool in my tool box when talking with K-12 educators – educators are glad to hear about the Fab Lab”
- General Good Idea
 - “I’ve attended one meeting, is an original idea which seems good”
 - “It is still in infancy but serves as a repository for good work and helps make connections”
 - Too early to tell. Has done some organizational work not it’s time to focus more on planning – need to see impact”
- “Negative comments:
 - “Opportunity to connect with like minds at the annual meeting, but communication is less robust after the meeting is over; USFLN still has to prove its value. I have connections to other Fab Labs – people are asking why they need th USFLN”

- “They’ve done nothing. Having a meeting every 6 months for business managers is meaningless. I can’t get ‘how to’ information out of them; the web site has been the same for 3 years; it is more of a network among 4 colleges – LCCC among them”

2. Greatest Challenges Associated with Network Development

- Variety and Diversity of Fab Labs
 - “It’s a heterogeneous group with different goals but using the same tools – it can be difficult to meet everyone’s goals”
 - “Each Lab is unique”
 - “We might share a mission but processes and requirements at institutions might differ – how do we get past variations in business practices and move forward?”
 - “Different educational standards in different states – trying to set up programs to fit with those standards”
 - “It is an open and dynamic network – they are in different situations and have different interests”
 - “Connecting all different kind of Fab Labs nationwide”
 - “Can’t forget about international links, particularly for the US Network not to forget that many other regions ‘tick’ very differently from the US (different mentality, different legal system, different system of charities, different measures, etc)”
 - “Bringing together people who have highly disparate needs for a Fab Lab”
 - “New labs are very different from one another now – MIT can’t offer the support now that they could when there were only 4 labs. Brand of Fab Lab is being diluted”
 - “Herding everybody together, considering the wide range of differences – if US Fab Lab is not talking to global fab lab that could be a problem”
 - “It’s like herding cats, everyone wanting to go in different directions”
 - “Standardization is a big challenge. Fab Labs based on MIT model are focused on cheaper/open source programs, but commercial labs use different software packages. There is an advantage to everyone using the same tools. If different software is used, compatibility will be a problem”
 - “Ownership. People doing different things, bringing everybody under the same umbrella. For example, those who are not part of the MIT might have different criteria”
 - “Finding a way to maintain its multi-discipline but still cater to specific disciplines”
 - “Finding all the Fab Labs”
 - “Making sure you develop specific goals that fit the diverse needs of the network members and stakeholders”
 - “Trying to meet everyone’s needs: academic, community, research labs, business based, museums”
 - “Labs are very different in their goals, staffing, will be difficult to assess their uniqueness, different needs”
 - “We operate on a voluntary basis where all are assumed equal but some have far more experience than others”
 - “People in Fab Labs are very idealistic. It requires much tolerance and tact to let them work together in a fruitful way. We have social and private norms and values that may sometimes make it difficult to see the common denominator”
- “Difficult to get the word out in a large way about the network – marketing is a challenge”
- “Educate high level college administrators and community leaders about the value of Fab Labs”
- “Reluctance of people to adopt new technologies and be comfortable with them”
- Finding a Niche/Benefits/Bigger/Value
 - “Convincing everyone to become part of the network – need to find a niche that can be an asset”
 - “Need a vision that makes people want to communicate advances in their own shop”
 - “Having a clear purpose and focus”
 - “Identify the benefit to offset the cost of collaborating”
 - “Helping people understand the concept in a sound bite and want to explore it”
 - “Maintaining a robust community of users – adjusting resources to new technologies used – things like Cloud computing, business models – the more of those kinds of things it can provide the more value the presence will be”
 - “Motivation to use the network – I don’t see much motivation now”

- “Any network is only as strong as the people who are in it and whether the value added is worth the time to be connected to it”
- “Getting universal participation”
- “Getting your own identity, have your own niche, get all networks to connect and be one big network”
- “Only as strong as the value it adds back to its constituents”
- “What is the exact purpose of the USFLN?”
- “What is the greater good for the network as a whole instead of individual labs unique needs”
- Administration of a Network
 - “Having dedicated staff to promote Network will be a challenge but important”
 - “Finding someone to administer the website – PBWorks tried but people didn’t upload to it much. After the Fab7 event there were no minutes or outcomes provided – assumed would get it but didn’t – not on website”
 - “Capital is required to get going”
 - “Getting regular communications going”
 - “Funding”
 - “Making it financially sustainable”
 - “Age old problem of who maintains it, who is the keeper of the keys, who sets the policies”
 - “Finding the right people to establish it and run it”
 - “People will ask what it costs – need to form a business case model to include costs”
 - “Will need more funding than they think it will; will need staff to visit other labs, someone to maintain a website, technical people to assist with issues, write technical manuals; need someone to write grants”
 - “Resources to manage and maintain group”
 - “Organizational hiccups – ending up with leaders who think they’re indispensable, friction between people, people involved who don’t contribute heavily or negatively contribute – making contributions for larger good is hard and requires extra effort”
 - “Sometimes community colleges and universities do their own thing and there is a divide between higher education and individuals – we’re already breaking off into fractions. I see community colleges on the website but not other organizations – There is too little communication and we all need to connect. If there are conferences I’m not hearing about them”
 - “The people I work with in the network are limited with time – time to develop mission/goals is tight”
 - “Time – people don’t have enough of it p this is a volunteer group”
 - “Everyone is so busy, hard to reach out”
 - “Biggest challenge is people. Aligning schedules. People are passionate about different aspects”
 - “Got it started but communications are needed”
 - “Organization inertia. Rallying the troops, typical problems associated with start ups”
 - “Financial resources – all wanting more equipment, budgets for marketing to increase awareness, ongoing demands for consumable supplies, raw materials, leadership”
 - “Lack of resources and time for people to come together which is beneficial even though there’s electronic communication”
 - “Takes time and resources”
- “Simply the pace at which we can roll out fab labs”
- “Developing Fab Labs themselves – without Fab Labs there can be no network”
- Demonstrated Results
 - “Will need a research base to show gains in student learning as a result of digital fabrication and Fab Lab work”
 - “Lack of documentation of success stories”

3. Opportunities for Network Development

Things Requiring More Attention Than the Network Could Provide To Date

- Technical Resource Development & Information Sharing
 - “Creating resources we can all use and share”
 - “Need a general structure for Fab Labs to follow – each model is different but there are commonalities around basic operation, management, pricing structures, and services”
 - “Generation and distribution of teaching modules”
 - “Act as a clearinghouse”
 - “Information about how to acquire hardware and software”
 - “Need a clearinghouse and resource center to share lessons in designs (i.e., STEM curriculum)”
 - “We need a Fablab.org to serve as a gateway or portal to all Fab Labs – kind of an FAQ. The Fablab.nl is pretty confusing and only a collection of blogs”
 - “Develop curriculum”
 - “Shared documents should be available online - accessing the Network should be very easy and to a large extent self service”
 - “Centralized repository for resources and discussion forums”
 - “Current web site is embarrassing – points to guides but there are no links to them”
 - “Keeping up with where people can find information – best practices dissemination”
 - “Make resources available in the form of electronic documents and specifications. For example, we would like to know how to set up poly com system and what to buy”
 - “More resources. When I click on resources I don’t get information”
 - “Figure out what kind of curriculum can be developed and shared – how Fab Labs can be used in schools”
 - “Need mentoring support since most Fab Labs are very small”
 - “Engage in group purchasing – use the Network to leverage with vendors”
 - “Joint purchasing, negotiating prices for Fab Lab supplies and equipment”
 - “Provide training and consulting”
 - “Central supply of hardware, software, materials”
 - “Provide face-to-face and lab-to-lab help”
- Financial Resource Development
 - “Lobby Congress for funding”
 - “Need to be resources we can share and leverage”
 - “Need resources to support Labs which are independent and not a part of a college, university or other organization”
 - “Creative financing like donating a share of profit back with Fab Labs”
 - “Guidance and connection to financing for those just getting started”
- Increased Visibility
 - “Work through engineering education associations and participate in other related national conferences like the National Technology Leadership conference”
 - “Create checklists or tool kits to help market and engage the public in Fab Labs”
 - “Help position Fab Labs via local business”
 - “Foster greater national recognition – is a real opportunity brewing nation wide with the maker movement – capitalize on Merck Magazine and network with other groups”
 - “Nation wide education about Fab Labs – finding a way to inform the public”
 - “Network to connect with power brokers nation wide in areas of STEM isn’t well connected”
 - “Develop regional profiles of what Labs are doing – who is doing what and where then spread word”
 - “Traveling road show to policy makers, national teacher organizations, state legislators, possible funders to show the benefits of Fab Labs”
- Conduct Research/Generate Impact Data
 - “Create a pre and post assessment we could administer to visitors and students Network wide to develop a critical mass of data”
 - “Do research to show an effective curriculum across STEM and other areas”

- “Show how Fab Labs are producing cultural change, impact on number of people going to college, going into engineering, finding jobs – return on investment for society”
- “Explore how agriculture and agriculture technology might fit or other areas that could be opportunities for the Network not thought of before”
- “More evaluation or research data to provide to members”
- “More attention on strategies for measuring success – help Fab Labs measure impact so data can be shared to convince funders to highlight what is being done”
- “Need metrics to measure success”
- Other
 - “Very clear vision statement and clear expectations of partners”
 - “Develop a strategic plan”
 - “Proper way of communicating between members. Meeting every 6-12 months with business managers is not effective”
 - “More frequent communications across the Network”
 - “Develop a business plan about how the Network will be operated”
 - “Have more members of the Network contributing to the Network”
 - “Look into health and safety standards for Fab Labs”

Things the Network Could Do to Help Going Forward

- Secondary school outreach & curricular products
 - “Help us reach and interact with high school and middle school students”
 - “Curriculum – project based; I don’t have university coverage”
 - “Access to curriculum module products – is there a way to remotely access to make available to school partners”
 - “Getting schools involved”
 - “Regional or statewide conferences inviting schools with matching missions to participate”
 - “I’m interested in alignment with K 12 and the K20 pipeline”
 - “Offer summer camps for kids; scholarships for kids by approaching businesses”
 - “Help us find classroom teachers interested in research projects using digital fabrication”
 - “Would like to know what we can do to serve kindergarteners through high school”
- Identify ways to fund/sustain
 - “How to fund insurance coverage”
 - “Identify ways to sustain Fab Labs – good case studies”
 - “Is there a common approach to funding”
 - “Get reduced rates on supplies; use aggregated weight of power to get software discounts”
 - “Biggest problem is funding – I made a product but need to know how to bring the product to market”
 - “Access to funding. We’re all struggling with that”
 - “I could use help with grant and resource development; it is difficult to find funding models”
 - “Need help with sustainability plans”
 - “Help with sustainability –everyone in the same boat. My lab was funded on soft money”
 - “Become national funding body”
- Information exchange/sharing
 - “Facilitate sharing of resources; an exchange”
 - “Sharing resources, projects, ideas”
 - “Share what is happening on a monthly basis”
 - “Need to see current status of Fab Labs”
 - “Clearinghouse for information”
 - “It’s just a labyrinth of interesting information now, it should all go into a distributed database. Look at instructables.com as a model (<http://www.instructables.com>)”
 - “Advice and information”
 - “Provide a communication channel to Fab Labs that they consider relevant, useful, interesting, and trustworthy so they actually read information coming through this channel”
 - “Access to best practices; sharing of experiences”
 - “Provide a source where I can look at designs, information from others, best practices”
 - “Central resource for information about running and using the Fab Lab”

- “Need information about configuring remote access, managing client expectations and little is documented on liability issues”
- “Interested in project ideas”
- “Would like to know what other labs are doing”
- “How to start, hard to organize, how to get community involvement”
- More networking & communication/connections
 - “Better communication”
 - “More networking”
 - “Yearly conferences in a location and time frame that travel is easier – not January in Midwest”
 - “Facilitate a discussion of how FL might fit into less obvious environments – links to different disciplines in sciences, business, - push the boundaries – laser cutter and CAD machine morphed into solving biological problems”
 - “More comprehensive website”
 - “Facilitate a local user group that meets regularly like once a year, twice a year or quarterly”
 - “Connections with others who are doing the same things”
 - “Ways to create linkages within the Network”
- Marketing/Public Relations
 - “Marketing tool kits to reach general public”
 - “Public relations. A general advertising campaign helping with community awareness; more ways to work with community in general”
 - “Marketing material about Fab Labs”
- Training & Professional Development
 - “We could use formal training – manuals and guidelines”
 - “Training and outreach”
 - “Professional development for faculty interested in getting into aspects of Fab Lab”
- “Provide access to equipment and materials”
- “More connected to business and industry”
- “Create business ideas and applications that could work internationally”
- “Metric data are vital to convince others of necessity for Fab Labs”
- “Help on the assessment component – the return on investment”

Other Opportunities for the Network into the Near Future

- “Reaching out to maker spaces that are around the country. They are an eclectic group. Being inclusive to them would be a big step”
- “One thing is the Maker Fair in CA, MI, NY, KA. No one knows what a Fab Lab is- need to market a lot more to this community”
- “The Nuts, Bolts, and Thingamajigs (NBT) Foundation provides starter grants to colleges interested in developing a manufacturing summer camp”
- “Become a broker for leveraging industry”
- “There is an untapped market for commercialized Fab Labs. We’ve discovered a whole niche of artists when we showed they can make jewelry and crafts”
- “Some models of how to tie to economic development – the tie to entrepreneurship, incubators”
- “People need incentives to want to tap into USFLN”
- “Get more small and medium businesses to look at Fab Labs for R&D”
- “I think of the ABC’s of Fab Labs: A stands for academics, B for business and C for community”
- “Business applications are rapid prototyping and entrepreneurship. These are being pursued at Baltimore County and Fox Valley”
- “Partnering with Department of Defense”
- “Offer certification, more formalized training leading to certification/mini-apprenticeship/degree granting”

4. Possible Threats to Progress

- Funding
 - “Total collapse of economy or total rebound of economy – needs to be somewhere in between”
 - “Fab Labs housed in educational institutions may be challenged with funding”
 - “Lack of money – competition for resources to support Fab Lab growth”

- “Continued challenges of finding funding”
- “Expense of putting it together and sustaining the Network”
- “Financial sustainability – we struggle to keep the doors open”
- “Funding/budget”
- “Funding. Criticism is that Fab Labs are an artificial environment. It’s customized manufacturing, personal manufacturing as opposed to mass production”
- “Need to generate a steady revenue stream”
- “Government funding is in crises right now”
- “Not thinking through sustainability from start to finish”
- Lack of Awareness/Misperceptions about Fab Labs & the Network
 - “If people perceive Fab Labs as high school shops, that would be a 2nd class status – it is not just a strange hobby”
 - “Lack of understanding about mission of Network”
 - “Limited exposure and visibility of Fab Labs”
 - “Lack of understanding/awareness by the public is a big barrier; need someone like Oprah to promote it”
 - “Knowledge barrier out there”
 - “People not understanding what it’s about – a lack of familiarity – what is the mission, it’s purpose?”
 - “Lack of clarity of purpose”
 - “Lack of vision”
 - “Tension among partners about vision”
- Poor Leadership
 - “Need to see work as part of the greater good; not set up for winners/losers – egos have no place at the table”
 - “If anyone dominates or controls it; territorial issues related to such organizations”
 - “Closed minds”
 - “Speaking from experience with consortiums, people use them to get individual resources not necessarily in the consortium’s best interest”
 - “Formalized leadership is needed”
 - “Need to be flexible, no too much control”
 - “If they try to be dictatorial, people would turn off very quickly”
 - “Leadership time commitments”
 - “Ineffective leadership”
- Lack of relevancy
 - “If it drifts”
 - “It’s easy to stagnate when you have a general mission, it needs to be more well defined”
 - “Not having a good ideas of what they are doing and then communicating that information to others”
 - “Inability to adequately serve network of Fab Labs themselves”
 - “People have no use for it”
 - “Loss of momentum. The maker movement is out there as a potential external market threat”
- “Too much information that cannot be digested”
- “Lack of communication”
- “Lack of support from community”
- “Whether the Network can include for-profits or not”
- “For profit labs offering greater benefits”
- “Commercial entities taking up white space”
- “Disconnect from International Network”
- “Liability issues”
- “Failure to connect core people”

B. Visioning

What the Network should be known for 5 years from now

- Economic Development
 - “A collection of successful products or companies that have been developed inside the Fab Lab Network”
 - “A kick start to the economy through small business development”
 - “Responsiveness to local and regional needs”
 - “Local solutions”
 - “Go to place for design build activities for patent seeking businesses”
 - “Support for workforce and economic development through innovative practices”
- Model Network for Fab Lab Collaboration Nation Wide
 - “Having organized and fostered a cross-pollination between all the spaces around the country”
 - “Having brought people together across the country to solve problems”
 - “Network known as the resource for all Fab Labs”
 - “The dictionary definition of a true network so it’s more open access/open source for information; everyone contributes and everyone takes out”
 - “Part of the vernacular among Fab Labs”
 - “Collaboration”
 - “Ease of collaboration and support”
 - “Robust network and communications with active partnerships and positive results”
 - “The source for collaboration and cooperation”
 - “Organizing force for activities other than conferences”
 - “Support and assistance to present and future Fab Labs so they are thriving and productive”
 - “Cooperative interaction”
- Educational Impact
 - “Providing support to the community through curriculum and organizational support”
 - “Having done an incredible thing to get schools across the country involved in the construction model”
 - “Demonstrated impact around increased teacher knowledge and interest in engineering and the range of engineering careers”
 - “Known for new and innovative ways to engage the learning process beyond its birth in science and math for all walks of life”
 - “Known as a school to teach about manufacturing”
 - “An advocate for hands-on learning”
 - “Fab Labs known as a gateway for lifelong adventures in science”
 - “Putting in place a new generation of makers”
 - “A central hub for communication”
- “A creative maker community that shares knowledge on a widely distributed basis”
- “Steward of standards for what a Fab Lab is in the US”
- “Catalyst for a true standardization of what a Fab Lab is and should be”
- “Keeping the open source ideal alive”
- “Modeling the best of open source software”

What members will say about the value of the Network 5 years from now

- “The Network turned the work into a focused movement and made a difference in the world”
- “We’re doing a great job”
- “It is worth their time to be a member”
- “It leverages common strengths”
- “Why don’t we do more projects like this”
- “IT is impressive”
- “A great place to work on your ideas”
- “Its good comprehensive training, extremely impressive equipment in a very organized setting”
- “It’s valuable”

- “Helps solve common problems”
- “It has the power of the Internet”
- “Helps support and expand the Network”
- “It lends expertise”
- “Provide guidance without sanctimonious judgment”
- “It is a creative maker community that shares knowledge on a widely distributed basis”
- “It teaches about manufacturing”
- “It is positive and very supportive”
- “Provides national and international help with fundamental ways of operating and becoming economically sustainable”
- “A useful tool and resource”
- “Has added value to coursework being taught”
- “Facilitates cordial collaboration”
- “Well worth being a part of it”
- “There is value in the Network”

What the US Office of Science & Technology will write about 5 years from now

- “Contribution it’s made to improving the economy”
- “A core component of resurgence of the American innovation”
- “Network is the first stop for small businesses needing assistance developing products into saleable products”
- “Effective communication network”
- “Best investment we’ve made in last 20 years”
- “Strong hub for information sharing”
- “Making a difference in advancement of STEM opportunities to K-16, business community, and community-at-large”
- “Have embedded itself into the culture”
- “The go-to-place”
- “The connection for all Fab Labs”
- “Has dramatically increased participation in the STEM workforce”
- “A creative maker community that shares knowledge on a widely distributed basis”
- “Opening our minds to possibilities of the future”
- “Fab Labs are a major player in STEM”
- “Uses scientific knowledge to create products/equipment”
- “Known for great inventions”
- “Known for addressing the lack of interest in science and technology”
- “Known for inspiring students to learn and achieve success in science and technology”
- “Fostering interest”
- “Encouraging people to pursue science and technology fields”
- “Job creation in science and technology”
- “Lifting communities economically”
- “If you are looking for a model for work in STEM, look at what USFLN has done”
- “Points to thousands who have taken advantage of the Network, their successes, newly developed business due to access to Fab Lab tools, fab lab products sold on ebay and overall economic contributions”
- “Bringing innovation to schools”
- “Providing access to digital technology among ordinary people”

What the Network will have achieved 5 years from now

- “Identifying different types of Labs and common infrastructure”
- “Connecting Fab Labs”
- “Cohort or regional networks thriving”
- “Will serve as a national technology incubator”
- “Demonstrated impact in a number of arenas: student learning, design/development, and economic development”
- “Raised awareness for the need for hands on experiences for students and individuals”

- “Spread this work to more schools”
- “Achieve broader public awareness”
- “Expanding the Network”
- “Maintaining focus”
- “Bringing opportunities from ideas to fruition”
- “Return on investment is known and shared to excite more people”
- “I’m not optimistic – it will be marginally better – they might have a website – it will be very slow going”
- “Has improved our learning systems”
- “Developing curriculum – Fab Lab Academy”
- “Creating a bigger and stronger network”
- “Network growth”
- “Reintegrating hands on learning into science and engineering classes at K12 level”
- “Not much if it doesn’t change what it has been doing”
- “A string of new inventions”
- “Identifiable success of students who have become scientists and engineers”
- “Its mission and purpose to be better understood”
- “Clear articulation of what we are about – universally accepted and understood”
- “Heightened awareness of MIT Fab Labs”
- “Built a strong community for members with successful collaboration”
- “Assisted in the growth of Fab Labs nation wide”
- “An organization with strong leadership and direction”
- “A clear vision of where it is going”
- “Have helped develop a class of individuals who are more efficient at making things, contribute to society by making things”
- “Connecting the Fab Labs so we know what all are doing and learn from each other”
- “Spreading the idea of Fab Labs and what they can do”

C. Membership Contributions & Fee Structures

Kind of contribution people are willing to make to USFLN

- Contribute time to USFLN
- “Talk it up to people; help start a Fab Lab here”
- “I work with the National Science Foundation; could help improve visibility”
- “We can show people how to run Fab Labs for profit”
- “Share impact we have had”
- “We share our results back with our community which can be shared with USFLN”
- “Would host a session to show how Fab Labs should work”
- “Our lab is an open book. Anything anyone needs we are willing to share”
- “Work on marketing strategy”
- “Share types of classes and formats we use”
- “Over time, programming and policy considerations”
- “I travel a lot and could give presentations where ever I go”
- “In my role in the research center, I could help build interest in Fab Labs via enewsletter and findings from this and other projects”
- “I could contribute a facility used in the Network for educational goals”
- “Could contribute how to make a lab self-supporting”
- “Stay current so I can keep other people current”
- “Develop a research base using student success with digital learning and fabrication design”
- “My lab could contribute lessons learned”
- “I can help find the right partners”
- “Educate teachers so they can help students understand how manufacturing works from concept to production”
- “I can contribute my thinking on economic sustainability and business models including innovation ecology and open source business”

- “Provide information on the Nuts, Bolts, Thingamajigs (NBT) Foundation”
- “I can speak and work on grant proposals”
- “Need some transparency to see what my contribution is going for – a once a year forum isn’t it”
- “Be actively engaged in Board to guide USFLN”
- “Be active in the Network, participate”
- “I could help with documentation, writing articles and recruiting more people to become involved with USFLN”
- “Be a part of the group”
- “Be a partner or platform to communicate best practices and advocating it with business partners here”
- “Willing to share what I’ve learned”
- “I could coordinate proceedings in academic presentation and conference and help identify sub disciplines under Fab Labs like engineering, architecture, etc.”
- “Document whatever I do so others can find it if they search”
- “Disseminating information to other labs and help play a role in building that community”
- “Sharing what we do in academic classes and support others in the local area”
- “Get more information out about the mission”
- “Continue as an initiator, a catalyst, and a connector”
- “I would help build a base for training people, especially if USFLN continues to have conversations with community colleges and technical schools”
- “Serve on leadership team”
- “Step forward to ensure my organization is involved”
- “As dean, I would like to create a Fab Lab to serve as the main tool for teaching engineering/STEM students”
- “Can assist with strategies for developing outcome measures”
- “Advising to local Fab Labs, help with marketing, raise awareness”
- “Documentation and sharing”
- “Know that you have friends at the International Fab Lab Association. We look forward to figuring out ways to cooperate as well as possible without obstructing each other. Fab Labs in developing countries are different, we have our own problems and we need our own space. US is perceived as rich. From the International perspective, we want everyone on board- rich, poor, academic and broader community”
- “I can help with evaluations”

Circumstances under which people would be willing to pay a membership fee

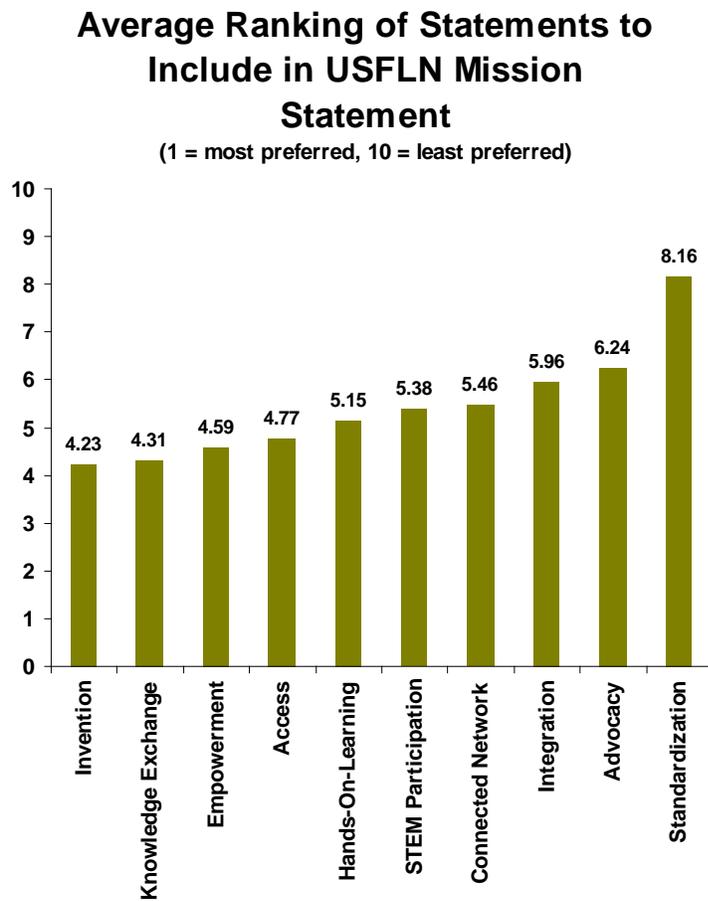
There is an openness to fee structures similar to other membership associations. However, charging a fee now is premature until the network is more established and has more to offer.

- “Contingent on benefits to membership”
- “Dependent upon is offered. Would have to be huge benefit to our lab and professional networking. At this time, I wouldn’t pay a fee. If it was for an organization, that would change things”
- “Develop a price structure tied to offerings – a minimum price for services like helping Fab Labs grow or how to manage a Fab Lab, etc.”
- “Best way is to get someone else to pay membership fee like a business organization to cover fees for all Fab Labs in their area”
- “If discounts for equipment and software were provided or discounts to conferences on digital design and fabrication”
- “More of a web presence and model for return on investment”
- “Would have to show a willingness to listen and change”
- “If USFLN becomes a hub, I would pay”
- “Depends on value delivered”
- “Look at other associations like National Business Incubator Association and National Association of Community Colleges of Entrepreneurship and their programs and cost structures”
- “The whole idea of an association”
- “List of experts on machinery and organizations”
- “The worldwide Fab Lab Network does not charge a fee”
- “If the Network develops or builds infrastructure”

III. On-Line Survey Results

Once the content analysis was complete from the in-depth interviews, an on-line survey questionnaire was designed and administered to the US FLN network. The overall intent of the survey was to prioritize key phrases to incorporate into a mission, vision, value statements and strategic priorities. A total of 60 individuals responded to the on-line survey. The following is illustrative of key findings.

A. Prioritization of Mission Statement Key Phrases



Key Phrases:

Invention: To collectively inspire creativity and invention of new products to solve real world problems locally, nationally, and globally.

Knowledge Exchange: Facilitating exchange of knowledge, ideas, resources, and successes among Fab Labs nation-wide.

Empowerment: Empowering people of all ages and backgrounds to experiment and invent.

Access: A collection of Labs offering businesses, entrepreneurs, and the general public access to the tools needed to conceptualize, design, develop, and test new products.

Hands-On-Learning: Bringing all types of academic disciplines together to promote and integrate hands-on, project based learning.

STEM Participation: Expands interest, enthusiasm, and participation in STEM education and careers nation-wide.

Connected Network: A highly professional, connected network of Fab Labs nation-wide and globally.

Integration: To integrate education and training, art, and the artisan, industrial production, and personal expression.

Advocacy: Advocates for instructional standards to advance STEM education at all levels across the U.S.

Standardization: Promotes standardization of processes and equipment nation-wide.

Additional comments associated with mission statement key phrases:

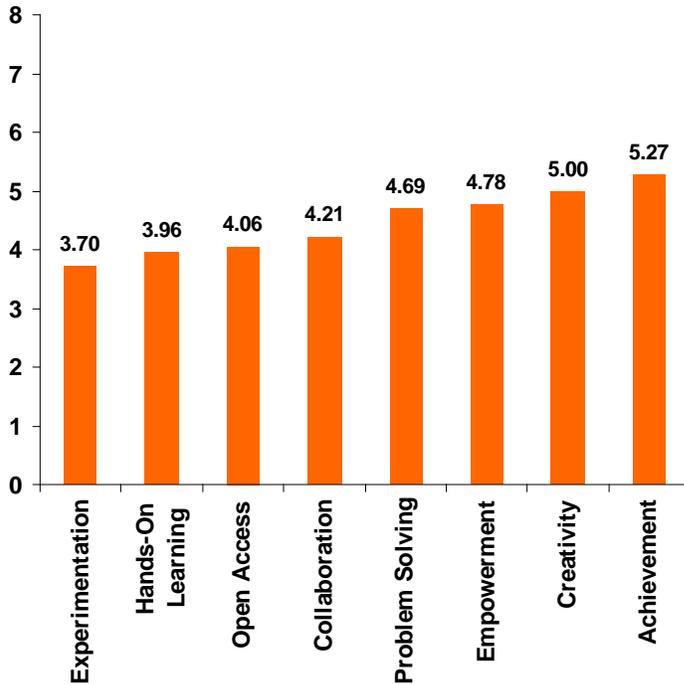
- To collectively inspire creativity and invention of new ideas to solve real world problems locally, nationally, and globally
- "Statement 1 (suggested change): Innovation: To collectively inspire creativity and invention, and solve real-world problems locally, nationally, and globally. Statement 7 (suggested change): Empowerment: Empowering people of all ages and backgrounds to create and innovate!"
- Our approach continues to pursue three dimensions in our mission--Inventor Support, STEM advocacy, and Knowledge exchange and infusion in our degree program options at Fox Valley Technical College. So can't select just one.
- Invention: I'd like this statement much more (probably #1) if "of new products" was removed. People will naturally gravitate to thinking up new products but in this statement, as written, it could be interpreted that the focus of a Fab Lab is consumerism. We are seeing a paradigm shift away from the Industrial Revolution and the USFLN should be careful not to make mistakes of the past. We should create an environment that nurtures creativity and inventiveness while being wary of creating a bias that may stifle a true creative genius. In the "Connected Network:" statement I object to the use of "highly professional" and suggest replacing it with "publicly accessible". It seems this should be a simple statement to support the "Knowledge Exchange:" statement. "Advocacy:", STEM has become a buzzword used while pandering to politicians and funding sources. In Neil Gershenfeld's book "FAB", read the chapter on "The Past". We are in a modern day Renaissance. The book lays out areas where we need to reinvent paradigms for education, manufacturing, and digital fabrication. "Integration:", I would suggest adding "through life-long learning" to the end of this statement. It should help reinforce the statement for "Empowerment:"
- Might think about 'innovation' rather than 'invention' as the concept is broader than product development, and includes how learning is delivered (and by whom).
- Hands on learning, empowerment, and access statements are good. The rest are vague, or confusing, or seem off topic.
- A collection of labs offering businesses, entrepreneurs and the general public access and training to the tools needed to conceptualize
- Creativity seems to run counter to promoting standardization
- I might change the term "invention" to "innovation" but can support either
- I would combine Knowledge Exchange, Empowerment, Access, Integration, and Hands-On-Learning.
- none
- The mission statement does not include information about the nature of FabLabs or what they are. Therefore it appears to be directed internally, toward those who already know what a FabLab is, and are committed to the concept, rather than externally.
- "* Interesting list, maybe we could use some elements when reviewing the fab charter.
- The name of USFLN suggests it is a network for all US Fab Labs (which are part of a worldwide network). Further learning is more than education and education is more than STEM.
- I believe we should start talking about STEMiE education in schools, with "i" being innovation and "E" being Entrepreneurship. It should be advocated at a very early stage.
- "Do NOT call it STEM. We need to promote Art as an integral part of tech -- call it STEAM!!! it sounds better anyway. USFLN exists to coordinate and promote FabLabs. Knowledge Xchange fits this most but misses the PROMOTES portion. We need lobbyists and cheerleaders."
- Advocacy: Advocates FABLAB expansion and STEM education at all levels across the U.S.
- the empowerment one is more like a vision
- At some point, the topic of 'IP' should be addressed. There are some innovators/inventors that are not comfortable unless that topic, in some way has been included in the context.
- No modifications recommended.
- None

Please describe any additional statements you would add to the mission

- The mission statement might have pieces of most of the statements incorporated into it; as a Center, you are a leader in education applied innovation, networking, etc.
- Since most Fab Labs are educational based including ours we use the following. The FabLab provides an educational lab environment that enriches technical, design, art and engineering programs by allowing students and community members to engage in individual or team design and fabrication projects.
- I think the concepts of entrepreneurship and/or incubation might also be appropriate as it relates to the next step beyond invention/innovation.
- Just be sure that training is included in the mix somehow. That is the critical element to use the new high technology equipment.
- none
- "see before (are all elements from the current fab charter included?)"
- The suggested statements are adequate.
- "Promote FabLabs. Oh I said that already... well it needs to be said again.
- FabLabs (and makerspaces) need to organizations to provide common promotion, especially in media and government."
- "I am a big fan of bringing curiosity back-it is not present in much of the current K-12 system. A curious mind never stops learning! Curiosity is defined as a need, thirst or desire for knowledge. The concept of curiosity is central to motivation and innovation."
- See question # 2.
- No additional statements recommended.
- none

B. Prioritization of Core Values

Average Ranking of Statements to Include in USFLN Value Statement
(1 = most preferred, 8 = least preferred)



Key Phrases:

Experimentation: We believe experimentation is the key to invention and overall economic sustainability for the U.S.

Hands-On Learning: We strongly value and support hands-on learning.

Open Access: People of all ages and backgrounds should have open access to space, equipment, and technology among people of all ages and backgrounds.

Collaboration: We believe collectively, we can do more than any one can accomplish alone.

Problem Solving: We believe all people can help solve real world problems.

Empowerment: We strive to empower businesses, entrepreneurs, and the general public.

Creativity: We believe that all people have creative talent.

Achievement: We believe Science, Technology, Engineering, and Math (STEM) education can be fun and attainable for all, not just engineers and scientists.

Additional comments associated with value statement key phrases:

- All of these are good.
- While I think I understand what is meant (and agree with it, given my experience with fab labs), the "Collaboration" statement seems cliché and philosophically overloaded (means too many different things to too many different people). The rest are difficult to order - they're equally important, as I understand them.
- none
- The core value statements frame the issue in a technocentric manner - i.e., a case of "when you have a hammer, everything looks like a nail" - rather than beginning with needs. This could limit the appeal of the group.
- "I will vote strongly AGAINST anything that uses the acronym STEM. STEAM yes, STEM no. Tech without Art is dead and/or evil. Why cant there be a combination of the selections? Maybe it makes too hard a run on sentence?"
- This was very difficult! so many are at the CORE of what i believe
- "Under the "open access"; lose the 2nd "among all people",etc.... Prob Solv-all people should have access to the resources, to help solve real..... Collab.- substitute the word 'accomplish' for the word "do", also. *Or at least, switch the two around.*"
- No modifications recommended

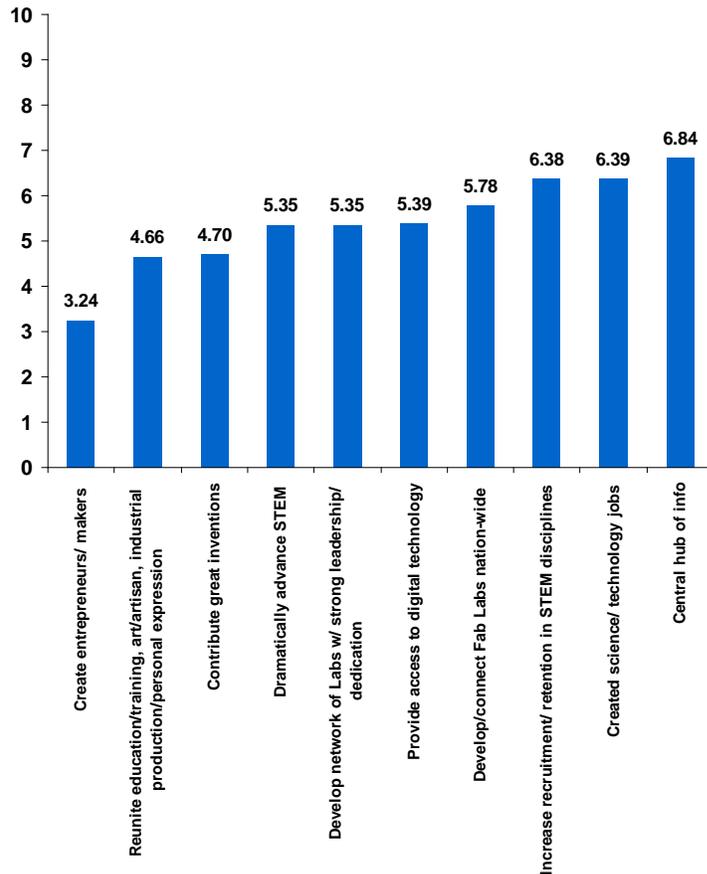
Please describe any additional statements you would add to the value statement

- na
- I think you have some good ones there!
- none
- The core values should ideally connect with national standards such as those developed by the National Council of Teachers of Mathematics (NCTM) and the National Science Teachers Association (NSTA). This approach could build upon considerable work that has already been undertaken in the STEM area.
- tbd
- Smart partnerships: We believe in forming partnerships with industry, so as to collaborate in creating the feeder system.
- Collaboration between art and science is essential. Working together, people with various talents can make so much more.
- No additional core values to consider
- none

C. Prioritization of Vision Statement Key Phrases

Average Ranking of Statements to Include in USFLN Vision Statement

(1 = most preferred, 10 = least preferred)



Key Phrases:

Helped create a new generation of entrepreneurs and makers.

Helped reunite education and training, art and the artisan, industrial production, and personal expression.

Contributed great inventions to the resurgence of American Innovation.

Dramatically advanced Science, Technology, Engineering, Math (STEM) interest and participation.

Developed a robust grassroots network of Labs with strong leadership and dedication.

Provided access to digital technology among ordinary people.

Developed and connected Fab Labs nation-wide.

Increased recruitment and retention in Science, Technology, Engineering, Math (STEM) disciplines.

Created jobs in science and technology.

Shared information from a central hub.

Additional comments associated with vision statement key phrases:

- Some are more tactical (e.g. create jobs) and less visionary. Perhaps instead of creating jobs, it would be to 'act as a catalyst for emerging areas of study (education) and occupations' as so many job titles and duties are/will be created from quickly developing technologies.
- "The first and last statement related to STEM seem redundant -- just one statement might be enough? I might also suggest combining "Developed and connected Fab Labs nation-wide" and "Developed a robust grassroots network of Labs with strong leadership and dedication" into one statement?"
- The contribution perhaps should be the "development of inventiveness," not "great inventions." "Providing access to digital technology" may be misunderstood - I think that it is important to emphasize that the ability to understand and create technology is paramount. OLPC provides access to technology (and is laudable for that), but doesn't necessarily provide much impetus to develop technology, for example. Shared information does not need to be organized by a central hub.
- none
- The vision statement appears to overreach in some cases. This type of work is challenging, and rarely has any single innovation been a magic bullet to solve educational problems. There has been a past history of over-

promising and under-delivering. Therefore, in the absence of hard data, statements such as "_dramatically_ advance STEM interest and participation" will weaken the credibility of the group.

- No modification required
- I HATE the acronym STEM. Buck the system. Replace it with STEAM. You know we need ART. You know The System has cut out art and crafting classes of all sorts over the years to push a corrupt idea called STEM. bleech.
- Reinvention of the art of making things
- No modifications recommended

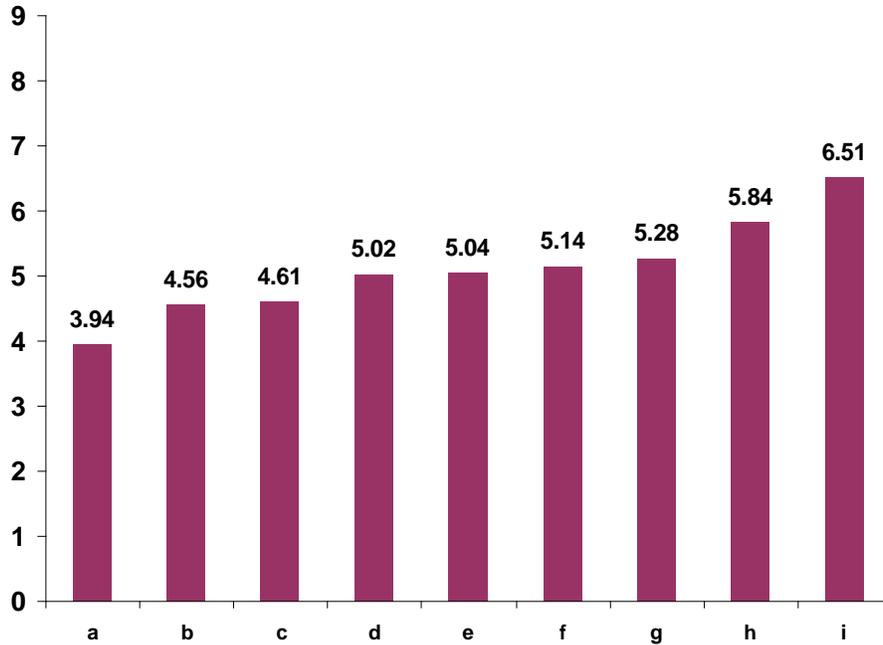
Please describe any additional statements you would add to the vision statement

- I personally think that use of acronyms, such as "STEM" in an organizations defining literature should be avoided. Emphasis on specific fields or use of more commonly used terms, improves audience comprehension and relates the ideas in a friendlier manner.
- na
- The vision statement could potentially provide useful perspective regarding ways in which the work of the Fab Lab network might build upon work that has gone before.
- Suggested statements are adequate
- Reconnect Art with Science Technology Engineering and Math, promoting the resurgence of making things locally, together.
- Have established a resurgence of entrepreneurialism (new word) and innovation for the world.
- No additional vision statements

D. Prioritization of Strategic Priorities

Average Ranking of USFLN Priorities

(1 = most preferred, 9 = least preferred)



- a. Develop educational support materials (curriculum development, training and professional development manuals, K-12 outreach, etc.)
- b. Establish a robust clearinghouse of Information to support Fab Lab growth and development (how to find insurance/liability coverage; creative ways to sustain labs; advice and information for new start ups; project ideas, etc.)
- c. Increase visibility at local, regional, national levels: (marketing and public relations tool kits for use at the local level; exposure with policy makers; etc.)
- d. Strengthen communications (face-to-face and lab-to-lab connections, discussion forums among members, conferences, etc.)
- e. Research and document impact of Fab Labs (develop a metric system to gather, track, monitor, and disseminate success/impact)
- f. Grow resources (launch a group/joint purchasing initiative for supply of hardware, software, materials, engage in collaborative grant writing, establish membership dues/fee structure, etc.)
- g. Cultivate distributed collaborative projects across the nation and globally
- h. Strengthen network administration (Dedicated leadership, organizational by-laws, strong, up-to-date interactive web site continuously maintained and monitored, strong volunteer network, etc.)
- i. Inventory Fab Labs to identify all tools used nation-wide (equipment, software, machines, equipment, etc)

Please describe any additional statements you would add to the strategic priorities.

- "Develop materials for self paced learning on the "identified" tools and on specific introductory projects and procedures.
 - Identify a consistent format that the materials should be developed.
 - Use the model that works well with Technology Education, where they have self paced modules that students can work independently and develop the skills in approximates 7-8 class periods.
 - This might mean that an adult learner could gain skills on a tool or procedure in 2-4 hours.
 - Of course CADD would take more, but a simplified process to get started could be identified.
 - Schools that create the materials can be identified on the instruction modules."
- Replicability and adaptation are the hallmarks of the Fab concept; as well as low-cost applications/projects. Sharing best practice models is also important - sharing how the labs affect students/others lives.
- I think this may come out of the goals listed above (especially Research and document impact of Fab Labs) but I was thinking about creating a "value" statement that speaks to both the hard and soft metrics behind the value of having a lab in place. This would include value to the individual, a small business, a new startup business, the community, etc. I think these are all things that an organization would want to know if considering a Fab Lab installation.
- none
- Development of CAD software designed specifically to support learning objectives would be a useful contribution.
- Finally, a question that list include that four letter word.
- Establish a group of "re-thinkers"; "second-guessers"; "*"devils' advocates"*; if you will. Basically, just what I am doing now. Use these people as a resource for when the tough questions need to be asked. Those questions that people tied to a project or idea may be too close to, to answer.
- no additional strategic priorities

IV. DRAFT STRATEGIC PLAN

U.S. Fab Lab Network

5 – Year Strategic Plan

<Draft for Consideration by USFLN in April 2012>

Our Mission

The USFLN is a connected network of Fab Labs who exchange knowledge, ideas, and resources to collectively empower people of all ages and backgrounds to experiment and invent new products to solve real world problems at local, national, and global levels.

Our Core Values:

Experimentation

We believe experimentation is the key to invention and overall economic sustainability for the U.S.

Hands-On Learning

We strongly value and support hands-on learning.

Open Access

People of all ages and backgrounds should have open access to space, equipment, and technology among people of all ages and backgrounds.

Collaboration

We believe collectively, we can do more than any one can accomplish alone.

Problem Solving

We believe all people can help solve real world problems.

Empowerment

We strive to empower businesses, entrepreneurs, and the general public.

Creativity

We believe that all people have creative talent.

Achievement

We believe Science, Technology, Engineering, and Math (STEM) education can be fun and attainable for all, not just engineers and scientists.

5 – Year Strategic Priorities

√ **Establish a Robust Clearinghouse of Information to Support Fab Lab Growth & Development**

√ **Develop Educational Support Materials**

√ **Strengthen Communication & Interaction Among Fab Labs**

√ **Cultivate Collaborative Projects**

√ **Increase Visibility at Local, Regional, & National Levels**

√ **Research & Document Impact of Fab Labs**

√ **Grow Resources & Strengthen Network Administration**

Our Vision:

The USFLN will be known as a robust network of grassroots Fab Labs who have dramatically advanced interest and participation in science and technology careers, collectively created a new generation of entrepreneurs; and proactively reunited education and training, art and the artisan, industrial production, and personal expression nation-wide, - all contributing to the resurgence of American innovation.

APPENDIX A: IN-DEPTH INTERVIEW GUIDE

**US Fab Lab Network
Strategic Planning Process
Stakeholder Interview Discussion Guide**

1. What would you describe as some of the greatest contributions Fab Labs have made to date?
2. What makes them unique?
3. Why is a US Fab Lab Network important?
4. Describe your familiarity with the US Fab Lab Network. How and when did you become aware of the Network? How have you been engaged with the USFLN?
5. What would you describe as the greatest accomplishments of the newly formed US Fab Lab Network to date? What, if anything, has the Network done for you?

If you have not been involved with the USFLN, why not?

6. What are some of the greatest challenges associated within developing a nationwide Fab Lab Network?
7. What kinds of things need more attention than the Network has been able to provide to date (i.e., those kinds of things you are anxious to see available through the Network but have not yet come to fruition)?
8. Because you have some association with a Fab Lab, what kinds of things could the Network do to help you in your work going forward?
9. What are some other areas of opportunity for the Network into the near future? What kinds of additional things might it do overall and for its members?
10. What might threaten Network progress going forward? (i.e., what are some of the barriers the Network might have to overcome as it pursues opportunities)?
11. Looking 5 years down the road, what do you want the Network to be known for overall and among its members?
 - a. What will members say about the value of the Network?
 - b. What will the US Office of Science and Technology and others write about the Network?
12. Overall, what do you think the Network will have achieved 5 years from now?
13. We have talked about a lot of different things. What is the most important thing for the USFLN to accomplish over the next 5 years?

14. What can you do to help contribute to achieve this mission/vision for USFLN? The commitment to your Fab Lab and overall digital fabrication (or what some are referencing now as the “Maker Movement”) is fully recognized by USFLN leaders, which is why we wanted to talk with you specifically. What kind of contributions might you be able to make to USFLN and what difference might they make?
15. Under what circumstances would you be likely to pay a membership fee to the USFLN? What kind of things would the Network have to accomplish for you to justify a membership fee?
16. What would be a reasonable annual membership fee from your perspective?
17. Can you suggest additional individuals or institutions we might want to talk with?
18. Just a few more questions and we will be finished. We want to make sure we are talking with a broad cross-section of Fab Labs nationally. Which of the following best describes your association with Fab Labs? [READ CATEGORIES; SELECT ONE RESPONSE ONLY (delete spaces around hyphens, below)]
- Community-based Fab Lab
 - Education-based Fab Lab
 - Business/Industry-based Lab
 - Non-profit (e.g., a Museum)
 - Philanthropy
 - Other
19. What is your zip code?

Thank you for your time and effort. We will send the results of the strategic planning process to you.

APPENDIX B: ONLINE SURVEY QUESTIONNAIRE

US Fab Lab Survey, February 2012

Introduction

As you may know, the US Fab Lab Network (USFLN) is a young organization in the midst of developing a strategic plan. A series of in-depth interviews were recently completed by the Public Services Institute with more than 70 individuals associated with Fab Labs nation-wide. Information gleaned from these interviews has been used to develop key phrases to inform the development of a mission statement, vision statement, and set of core values to frame our work over the next 5 years. Please take the time to help us prioritize these key phrases and strategic priorities (or goals) for our organization.

1. Mission statements describe the overall purpose of an organization. Please rank order the following statements with 1 being your top preference for a MISSION statement and 10 being your least favorite statement to include in the US Fab Lab Network mission.

	1	2	3	4	5	6	7	8	9	10
Invention: To collectively inspire creativity and invention of new products to solve real world problems locally, nationally, and globally	<input type="radio"/>									
Connected Network: A highly professional, connected network of Fab Labs nation-wide and globally	<input type="radio"/>									
Knowledge Exchange: Facilitating exchange of knowledge, ideas, resources, and successes among Fab Labs nation-wide	<input type="radio"/>									
Standardization: Promotes standardization of processes and equipment nation-wide	<input type="radio"/>									
Advocacy: Advocates for instructional standards to advance STEM education at all levels across the U.S.	<input type="radio"/>									
Access: A collection of Labs offering businesses, entrepreneurs, and the general public access to the tools needed to conceptualize, design, develop, and test new products	<input type="radio"/>									
Empowerment: Empowering people of all ages and backgrounds to experiment and invent	<input type="radio"/>									
Hands-On-Learning: Bringing all types of academic disciplines together to promote and integrate hands-on, project-based learning	<input type="radio"/>									
STEM Participation: Expands interest, enthusiasm, and participation in STEM education and careers nation-wide	<input type="radio"/>									
Integration: To integrate education and training, art and the artisan, industrial production, and personal expression	<input type="radio"/>									

2. Please describe any modifications you would recommend to the statements above.

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3. Please describe any additional statements you would like considered as part of the US Fab Lab Network MISSION statement that are not included above.

4. Core values describe the behaviors an organization is committed to following in all that they do. Please rank order the following value statements with 1 being your top preference and 8 being your least favorite VALUE statement to include for the US Fab Lab Network.

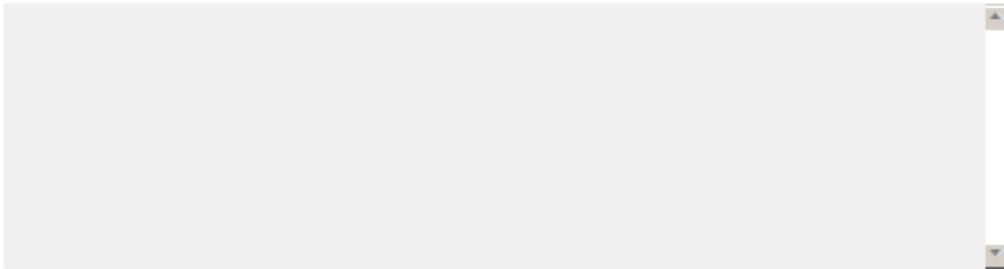
	1	2	3	4	5	6	7	8
Experimentation: We believe experimentation is the key to invention and overall economic sustainability for the United States.	<input type="radio"/>							
Empowerment: We strive to empower businesses, entrepreneurs, and the general public	<input type="radio"/>							
Hands-On Learning: We strongly value and support hands-on learning	<input type="radio"/>							
Creativity: We believe that all people have creative talent.	<input type="radio"/>							
Problem Solving: We believe all people can help solve real world problems	<input type="radio"/>							
Open Access: People of all ages and backgrounds should have open access to space, equipment, and technology among people of all ages and backgrounds	<input type="radio"/>							
Collaboration: We believe collectively, we can do more than any one can accomplish alone	<input type="radio"/>							
Achievement: We believe STEM education can be fun and attainable for all, not just engineers and scientists	<input type="radio"/>							

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5. Please describe any modifications you would recommend to the statements above.



6. Please describe any additional core values you would like considered as part of the US Fab Lab Network VALUE statements.



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7. A vision statement should be inspirational and describe what the Network should be known for 5 years from now. Please rank order the following phrases with 1 being your top preference for a VISION statement and 10 being your least desirable statement to incorporate into the US Fab Lab Network VISION statement.

	1	2	3	4	5	6	7	8	9	10
Dramatically advanced STEM interest and participation	<input type="radio"/>									
Contributed great inventions to the resurgence of American Innovation	<input type="radio"/>									
Provided access to digital technology among ordinary people	<input type="radio"/>									
Developed and connected Fab Labs nation-wide	<input type="radio"/>									
Created jobs in science and technology	<input type="radio"/>									
Shared information from a central hub	<input type="radio"/>									
Helped create a new generation of entrepreneurs and makers	<input type="radio"/>									
Developed a robust grassroots network of Labs with strong leadership and dedication	<input type="radio"/>									
Helped reunite education and training, art and the artisan, industrial production and personal expression	<input type="radio"/>									
Increased recruitment and retention in STEM disciplines	<input type="radio"/>									

8. Please describe any modifications you would recommend to any of the Vision statements above.

9. Please describe any additional vision statements you would like considered as part of the US Fab Lab Network VISION statement.

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10. The Network needs a clear set of strategic priorities or goals to focus its work over the next 5 years. Please rank order the following priorities from 1 – 9:

	1	2	3	4	5	6	7	8	9
Inventory Fab Labs to identify all tools used nation-wide (equipment, software, machines, equipment, etc)	<input type="radio"/>								
Establish a robust clearinghouse of information to support Fab Lab growth and development (how to find insurance/liability coverage; creative ways to sustain labs; advice and information for new start ups; project ideas;	<input type="radio"/>								
Research and document impact of Fab Labs (develop a metric system to gather, track, monitor, and disseminate success/impact)	<input type="radio"/>								
Increase visibility at local, regional, national levels: (marketing and public relations tool kits for use at the local level; exposure with policy makers; etc.)	<input type="radio"/>								
Develop educational support materials (curriculum development, training and professional development manuals, K-12 outreach, etc.)	<input type="radio"/>								
Strengthen communications (face-to-face and lab-to-lab connections, discussion forums among members, conferences, etc.)	<input type="radio"/>								
Grow resources (launch a group/joint purchasing initiative for supply of hardware, software, materials, engage in collaborative grant writing, establish membership dues/fee structure, etc.)	<input type="radio"/>								
Strengthen network administration (Dedicated leadership, organizational by-laws, strong, up-to-date interactive web site continuously maintained and monitored, strong volunteer network, etc.)	<input type="radio"/>								
Cultivate distributed collaborative projects across the nation and globally	<input type="radio"/>								

11. Describe any additional strategic priorities or goals you would like to see added for the US Fab Lab Network.

Just a few more questions and we will be finished.

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12. Please enter the likeliness that you would do the following:

	Extremely Likely	Somewhat Likely	Somewhat Unlikely	Extremely Unlikely
While the US Fab Lab Network is a very young organization just starting to build its resource base, how likely would your organization be to pay an annual membership fee of \$500?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
How likely would you be to pay an individual annual membership fee of \$200 to access Network resources?	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

13. What is your zip code?

Zip Code

14. Which of the following best describes your association with Fab Labs or the Fab Lab with which you are, or have been, associated? (Choose only ONE)

- Community based Fab Lab
- Education based Fab Lab
- Business/Industry based Fab Lab
- Non-profit (e.g., a Museum)
- Philanthropy
- Other (please specify)

Thank you for your time!