

NOT "RANDOM ACTS OF STEM:" PLANNED CAREER SUCCESS

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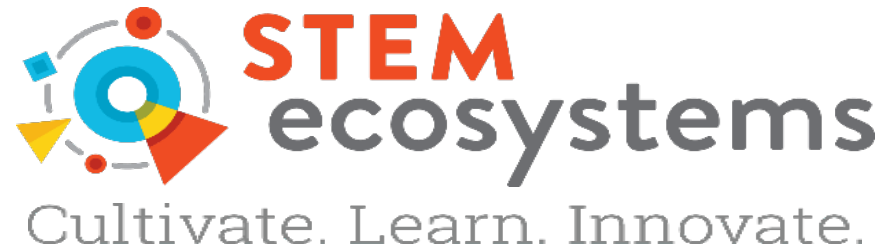
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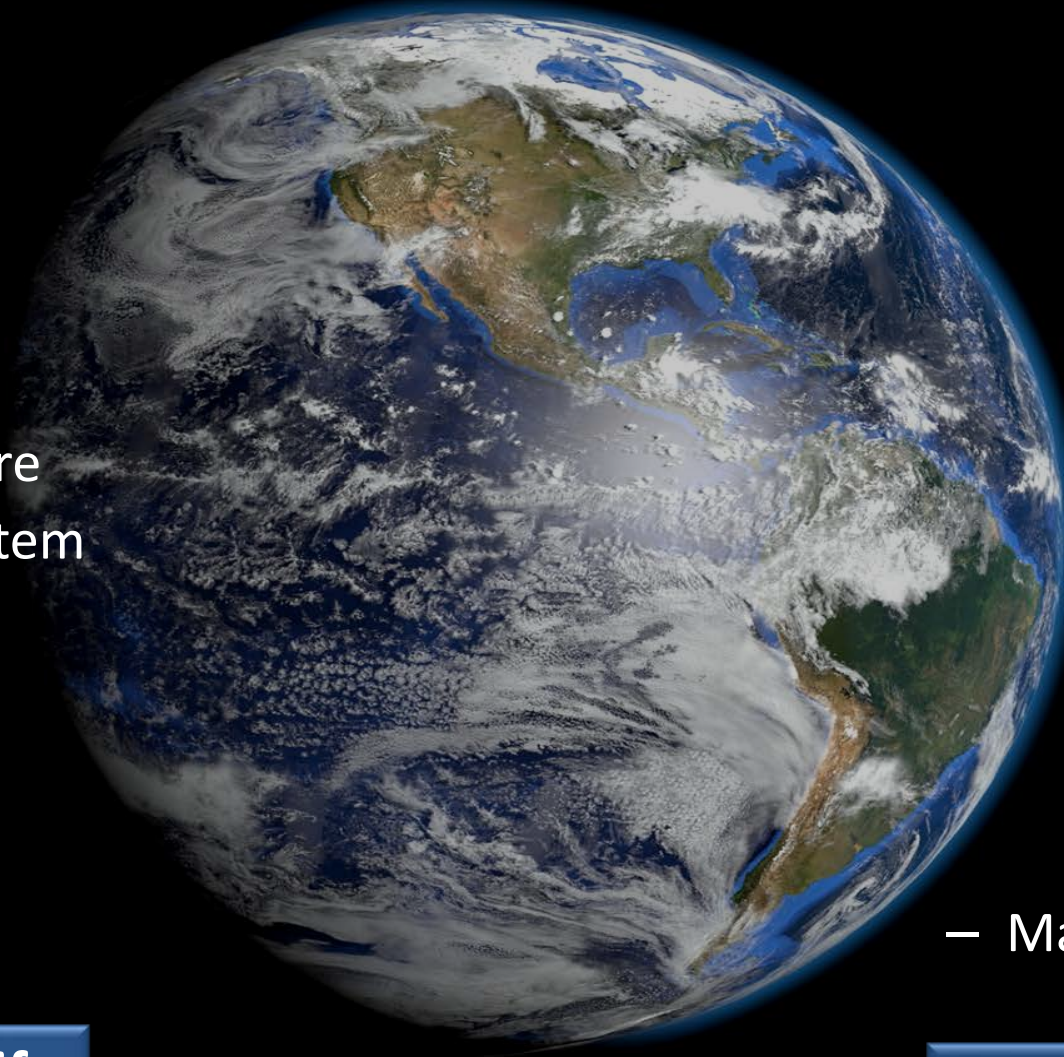
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CHALLENGES

Level 1

- Climate Change
- Water Scarcity
- Energy Security
- Cyber Security
- Global financial structure
- Biodiversity and Ecosystem losses
- Fisheries Depletion
- Deforestation
- Infectious Disease

Eliminate our way of life



Level 2

- Aging Population
- Poverty
- Education
- The Digital Divide
- Urbanization
- Intellectual property
- International labor and migration
- E-Commerce rules
- Biotechnology rules
- Maritime Safety and Pollution

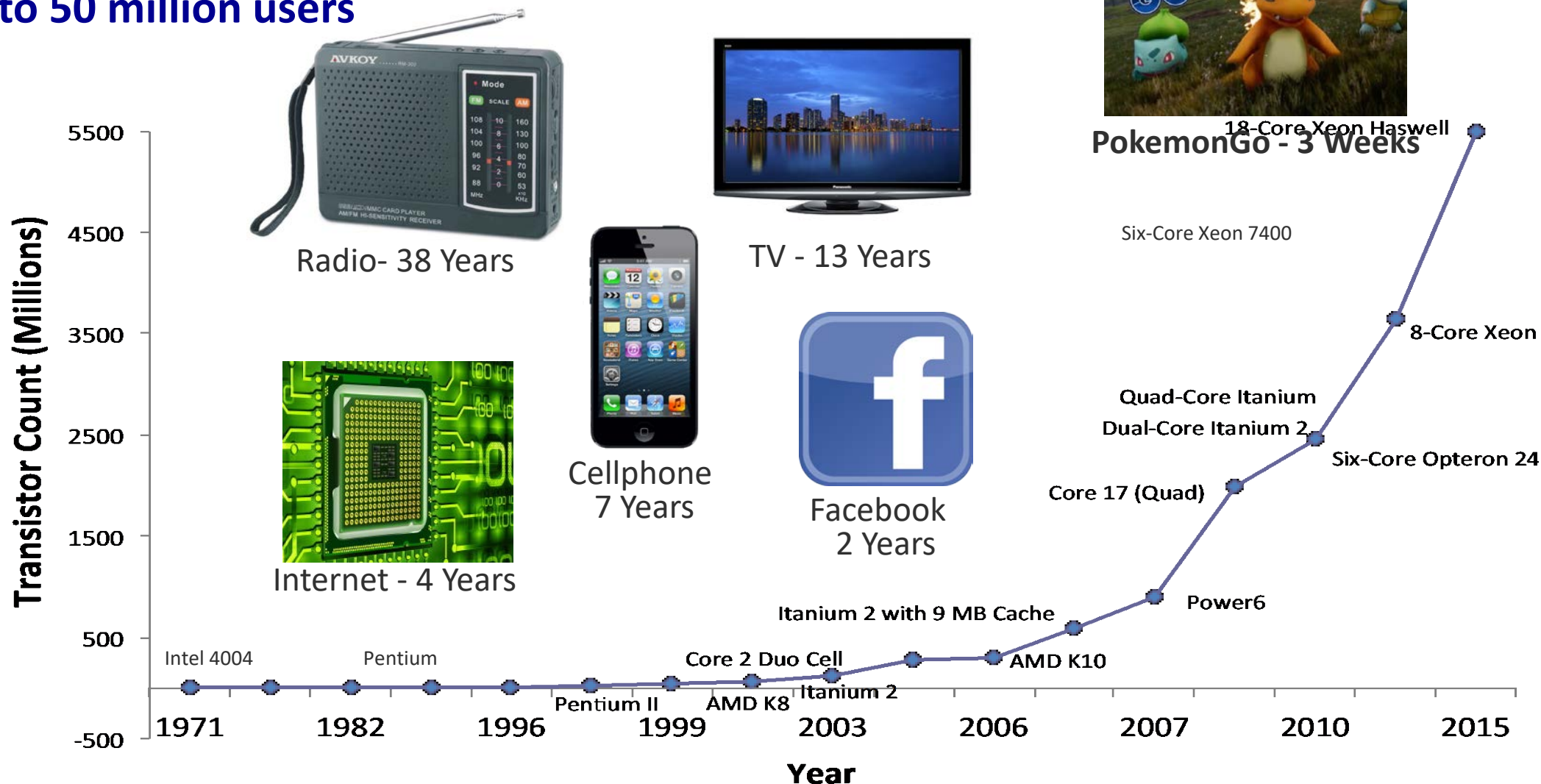
Disruptive to our way of life



CHANGE

UCI Samueli
School of Engineering

Years to 50 million users



More than half of the top 10 in demand jobs in 2017 did not exist in 2007



Sustainability
manager

Content
creator

Big data
analyst/data
scientist



Cloud computing
specialist



Drone operator...



...and countless more.



CHANGE

ADVANCED ECONOMIES

38 million to 40 million **fewer workers** with tertiary education **than will be needed**

13%
too few

COLLEGE OR
POSTGRADUATE DEGREES

DEVELOPING ECONOMIES

45 million **fewer workers** with secondary education **than will be needed**

15%
too few

SECONDARY EDUCATION

Globally

90 million to 95 million **more workers** in advanced economies that do not have college degrees, or in developing economies that don't have secondary education **than employers need**

13%
too many
LIMITED EDUCATION



COMPETITORS

SHANGHAI
1987 2010

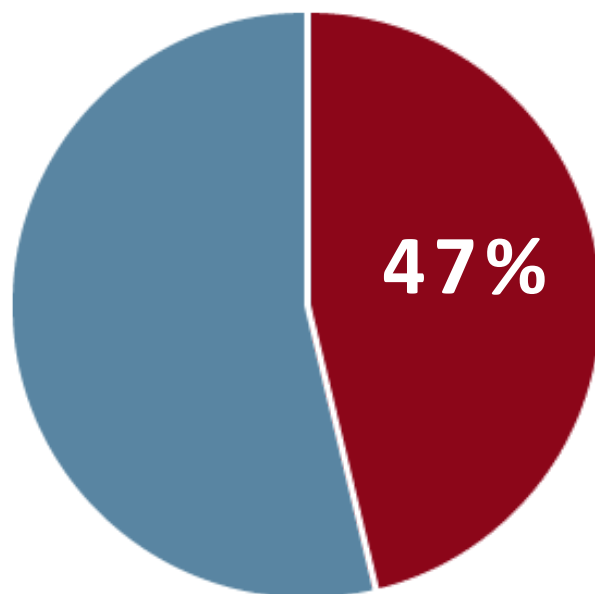




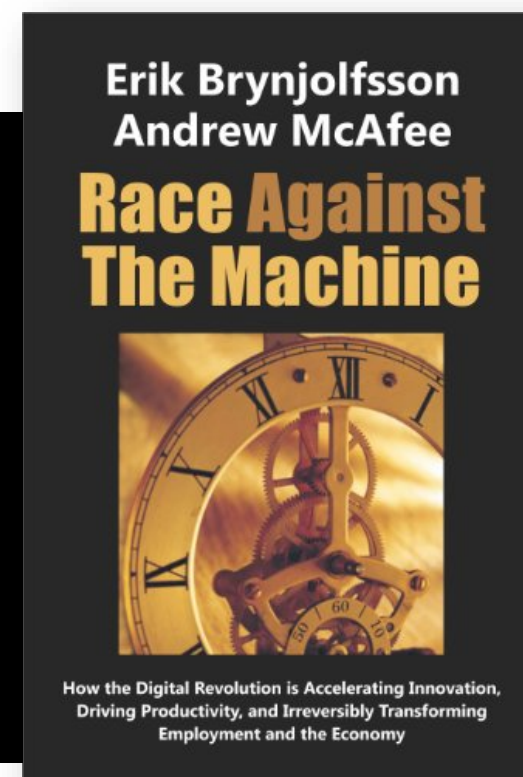
COMPETITORS

PROBABILITY OF COMPUTERIZATION

US EMPLOYMENT AT RISK



Telemarketers: **99%**



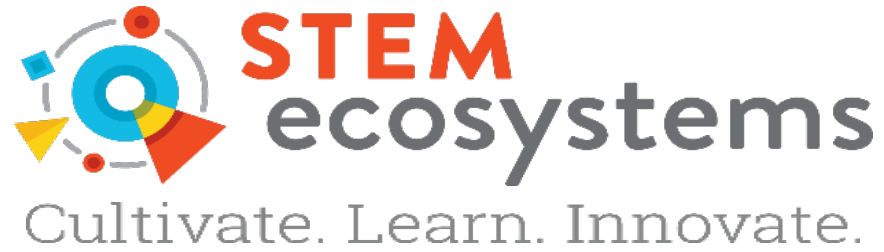


COMPETITORS

UCI Samueli
School of Engineering



**Craig Alexander 3X
ironman Champ**



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“Urgent Futures”



Design Institute for the Future
Powerworld

LEARNING IS EARNING
in the national
learning economy

Until recently, we thought of learning, and living as separate experiences. We spent most of our childhood in school and our adult years working or looking for work, and squeezed our personal time into whatever brief windows of time were left. We had "education" early in life, stopping when we reached the limits of our minds. We had work, money, or multidisciplinary offerings, and at that point we moved on to the next blue collar, white collar, and professional workers. And then we moved on to the next kind of live to which we could aspire.

Today, an emerging learning economy is reshaping the way we live. We are now

Today, an emerging learning economy is changing all that as learning becomes a currency for everything we do. Unbounded learning resources are creating opportunities for continuous growth, opening the future to new possibilities and aspirations. Blends of digital and physical experiences are creating platforms that make it possible to integrate learning into workflows that are blurring the boundaries between life and work and between learning and living. These platforms provide continuous feedback that helps us adapt and shape our environments to our personal needs, platforms, and life circumstances. They use computer algorithms—intelligent programs—to match us to people and opportunities that can help us find our true value and meaning. They support collaborative networks that can change the world. In our communities, in the process, we build our individual working—learning—living—definitive roles we'll play in a fast-paced economy of change.

These flows, resources, platforms, and programs are the building blocks of a new economy. How we invest in them and build them will determine the future of our communities in a continuous cycle of learning and growth.

These flows, resources, platforms, and programs connect people and help them adapt and thrive. As we support collaborative networks that can change the way we work and help us find workable solutions at work, at home, and in the process, we build our individual working-learning team to make sure we're playing a fast-paced economy of change.

**LEARNING
IS EARNING**
in the national
learning economy

maior
min dnet

Division 1 is a platform for institutions and
colleges/universities, where the notion of a place
"goes up" as the higher approaches.

digital-physical blends
 Embedded intelligence turns every space and activity into a learning exchange

CTI brings a wide variety of technology to market, using embedded technology to enhance communications between individuals in the medical and health care industry, and personal devices of a location for international partnership.

learning
contribution

Miss World your design helps users to track their overall efficiency by showing monthly digital badges that are then displayed in a "digital backpack."

employees' training platform, fast-track courses relevant for each job they complete and create a more consistently proven skill set with hyper-specialized skills paths, sponsored by

MySo is a global health solutions network, and an increasingly vital link in a new generation of solutions with the people around the world.

**solutions
networks**

Collaborative learning
builds marketplace solutions
to problems in work and in life

**Thousands were introduced to people-
powered movement...** happening into a
new narrative of "collaborative resistance"
analysis movement into an action and
an algorithmic network model.

unbounded resources
Access to abundant information and learning resources jumpstarts advancement

Warning: *Not* independent learners that industry-courtesy that are certified and are highly dependent on looking to him directly for these specific skills. www.cisco.com

digital natives

continuous
learning flows

Every exchange is a moment for discovery, skill building, financial reward—and fun!

Learn on MOH is a directory of traditional learning opportunities in 17th-century Hollywood, including guided public affairs and digital connected learning experiences that allow learners to build knowledge while connecting with community.

Degraded constricts every moment a learning moment, including what happens around others. It creates a barrier of ignorance, knowledge and skills based on their learning history.

Learn an app that cross-trainable, interactive mind systems for teaching a dog how to work in small urban areas on the go, making it easy to integrate learning activities go about their day.

personalized experiences

Adaptive learning experiences increase fit and fitness for success and satisfaction in life

Collages the Internet joins nontraditional students with a mentor who leads a unique educational plan for them and helps them create an online portfolio.

Casper Fenger is a key international thought leader who connects to 2016's vision of innovation, team work, and growth with a CEO as they mature and their needs change.

The program is a relationship-driven tool that harnesses the power of gratitude for the leader, helping working leaders to identify or imagine what individuals are doing well and getting them in the right mindset for the task at hand.

actionable
feedback

Data analytics maximizes return on learning investments

NEW new-voice processes students' changing identities and women's individual goals for career advancement. They make it all clear — producing a new journal map of the field in under four years.

www.oxfordjournals.org/oxford-journals



Don't
 Take
 the
 time

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FROM



TO

- Scattered Efforts
- Episodic Education
- Letter Grades
- Textbooks
- Degrees
- One-size Fits All
- Best Guesses
- Static Environments



- Solution Networks
- Continuous Learning Flows
- Actionable Feedback
- Unbounded Resources
- Dynamic Reputations
- Personalized Experiences
- Algorithmic Matching
- Digital Physical Blends

Our **learning lives** and **working lives** are merging into **ONE**.

FORESIGHT

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foresight 1

a work+learn future

BEYOND TODAY'S CONVERSATIONS ABOUT DEGREES AND CERTIFICATIONS, THE BIGGEST DISRUPTION MAY COME IN THE PERMANENT BLURRING OF WORK AND LEARNING.



Shape Shifting Organizations **allow diversity and innovation to thrive.**

FORESIGHT

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foresight 2

shape shifting organizations

THE MOST IMMEDIATE THREAT TO OUR SOCIETY WILL NOT COME FROM MILLIONS OF UNEMPLOYED HUMANS, BUT FROM INSTITUTIONS THAT FALL TRAGICALLY OUT OF SYNCH WITH THEIR ENVIRONMENT.



Shape Shifting™ Organizations

- **NO CENTER**—more distributed authority, less centralized
- **LIQUID HIERARCHIES**—hierarchies come and go, liquid data
- **GROW FROM THE EDGES**—where diversity flourishes
- **CANNOT BE CONTROLLED**—but can be guided



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Shape Shifting™
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Anything that **can** be distributed **will** be distributed.

FORESIGHT

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foresight 3

navigating decentralization

ROBOTICS AND MACHINE LEARNING WON'T REPLACE AS MANY JOBS AS MANY THINK, BUT THEY'LL REPLACE MORE KINDS OF JOBS THAN MOST ASSUME.



THE #FUTUREFIT SUPER SKILLS

The future is all about performance. Whether you're a Lyft driver or a consultant looking for referrals on LinkedIn, your performance ratings will probably count more than your resume.

And skills are the path to high performance ratings.

Skills connect what you know to what you can do, and what you can do is what will earn you money, confidence, and a lifetime of rewarding experiences.

Whether your goal is to build your strengths across all five peak performance zones of the training circuit or to become a master of one or two of the zones, the super skills are the building blocks of your workout.

MAKE YOURSELF KNOWN



Brands aren't just for celebrities anymore. In a world where continuous monitoring and big data analytics drive industries like advertising, retail, design, gaming, and education, a core skill for the future is knowing how to protect, trade, donate, and reap your own value from data about you. This is how you'll manage your reputation and build your personal brand—and learning how to curate your brand in multiple media and many cultures is the first key to success.



Dexterity is about being nimble, agile and well skilled for the task at hand. (Quite literally, dexterity means hand skills.) In today's worldwide networks, you're going to be working, thinking, creating, and playing outside your native culture every day, and multicultural dexterity will give you the ability to quickly and appropriately shift your mindset, grasp local memes, and employ local rules of engagement to your benefit—all in multiple media.



Your life is your resume. Learning is moving out of classrooms and courses and into the streets of everyday life, and you need to get credit for everything you accomplish throughout your day. This credit-for-everything approach will set you up for the next task, job, or adventure. Spotting the patterns in your credits will help you level up, recognizing what you're good at, what you care about, and how to put those talents and passions to work for the future you want.

BEFRIEND THE MACHINES



The workforce of the future isn't just humans. Machine intelligence—whether it's embedded in robots or traversing the web as smart bots—will change the way things get done. Regardless of whether you work in a warehouse or the White House, you'll need to know how to team with these bots and robots. You'll need to know when to trust them and how to test them. You'll assemble teams of them, teaching them and deciding which of them are best for which tasks. In short, with all these AIs reporting to you, you'll need to be a manager and a leader, wherever you're working and whatever you're doing.



The future is digital. As this digital world grows by leaps and bounds, so do the skills you need to stay up-to-date in the marketplace of work and well-being. Just like the apps on your smart phone, these skills need frequent upgrades. You need to move with fluency from medium to medium, from platform to platform, from code to code. You need a strategy for keeping up with the digital standards and practices of the future path you're pursuing. Everything else depends on this.



The future is an augmented reality with virtual worlds everywhere you look. As more and more work is performed in these worlds or with the digital overlays of augmented reality, you need to know how to navigate these layers of reality, how to make things happen in them and with them, how to use them to communicate and collaborate, and perhaps even to build them—all while keeping your feet on the ground in the physical world.

BUILD YOUR TRIBE



Impermanence is the shape of the future. From factories and stores to supply chains and social connections, the world you'll work in will be constantly changing. And perhaps the most important skill you'll need for the what's-next future is the ability to pop up communities when and where they're needed. Whether it's creating a globally connected innovation zone in the middle of Detroit or building a shelter for climate refugees in the Caribbean, you need to be ready to find community resources, work around local regulations, and tap grassroots energy and imagination to build a never-before community.



All the world is a design project, and everyone is a designer. You're going to design products, services, and experiences with people everywhere. As work becomes more global and more volatile, you'll need to grow these skills to design for impermanence, for immersive media, for AI-assisted manufacturing, and AI-driven disease diagnosis. You'll draw often on open data from around the globe to solve small pieces of big puzzles, and you'll need to master peer-to-peer prototyping, for everything from insurance policies to health care to running the country.



Digital currencies are the strange attractors of the next decade. These are the peer-to-peer coin exchanges that can make you a billionaire overnight or crash your holdings just as quickly. More important, they are the new tools for connecting physical things to the internet, managing shared resources like neighborhood solar grids, and tracking products from start to finish. Whether you're a blockchain coder, a Bitcoin miner, or just someone who uses cryptocurrency to tip your favorite online musician, digital currency skills will help you

MAKE SENSE



You've heard of big data, but big stories are what's next! You'll need to master tools that reveal the hidden chronicles in large volumes of data. You'll want to understand how human brains are wired for stories and what rouses people to action. You'll apply this knowledge to everything from selling a product to healing a broken heart—or a broken community. You'll do this in every medium, from text and photos to video and 3D immersive virtual realities.



Time was when futures thinking happened in ivory tower think tanks and secret military planning facilities. Today, futures thinking is for everyone, and you need to build your capacity to think long term. You need to understand the difference between possibilities and probabilities. You need to build your own craft of scenario planning, turning scenarios of the future into things you can experience today. You need to build foresight that leads to insight that jumpstarts action today. Foresight. Insight. Action. That's futures thinking.



Complexity can look like chaos, but humans are masters at connecting the dots to create clear pathways in a forest of confusion. This is the core skill you need to make any change in your life—or in the world around you. You'll need to connect your dots in unexpected ways. Everything is a potential medium for change: food, medicine, fashion, construction, farming. Your task is to find the medium where you can clearly see the connections to the larger changes you want to make in the many worlds you occupy

KEEP IT GOING



The safety net is frayed. As you carry a greater burden of risk for everything from managing your health to building your wealth, you need to become an insurance broker for yourself, with new tools for reducing your risks. You also need skills for converting risks into assets, often by sharing both risks and resources—for everything from knowledge and data to health, energy, and climate. You need the know-how to build vast new safety nets across these many extreme environments.



The future of ethics and equity hangs in the balance. In a world of diverse values and cultures, it's easy to believe that a shared set of ethics is a thing of the past. But you can participate in an ethical, equitable future that benefits everyone if you learn to think beyond T-shirt slogans and Twitter arguments. You will need to discover what both traditional philosophers and cutting-edge neuroscience have to say about the unique human capacity for ethical thinking and cooperative behavior. Then you'll need to turn that knowledge into skillful, ethical encounters with both humans and smart machines.



Extreme environments demand extreme caring. To meet the demands of a world under pressure from aging populations, from climate-ravaged communities, and from a health care industry that must serve more people with fewer resources, everyone will need a higher caring IQ. New insights into the nature of empathy, of social and emotional intelligence will lead to new tools and strategies for developing these important human capacities. You will use this new kind of intelligence as a foundation for new ways of caring for yourself, your family, your network around the world, and the planet itself. Ultimately, this is the purpose of all our labors: to take care of one another

www.futurefit2030.org



BEFRIEND THE MACHINES



Machines are getting smarter

Some of them will work for you. Sometimes you'll work for them—
or even in them. More and more, you'll work side by
side to get things done.



AI IQ

Can you put a workforce of
hundreds of smart digital
assistants to work for you?



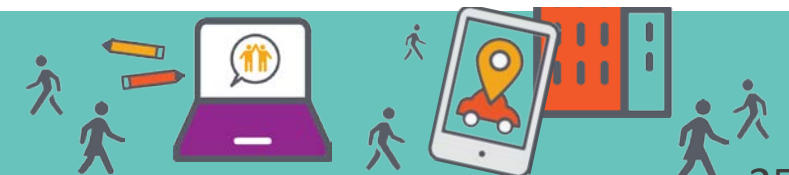
Digital Fluency

When machines talk to
you, do you know how
to talk back?



Simulated Action

Do you move as
easily in VR and AR
worlds as you do in
the physical world?





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SO...WHAT DO WE NOW KNOW?

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Our World Has Changed

Confronted with Challenges....
Life Threatening

Don't Know What Future Holds

Don't Know What Future Jobs Will Be



HOW DO WE EXPECT EXISTING SYSTEMS TO:

Educate our society

Equip educators with the skills needed

Develop skilled competent workforce



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WHAT WE NEED...



New
paradigm

New
architecture



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STEM-Rich Institutions



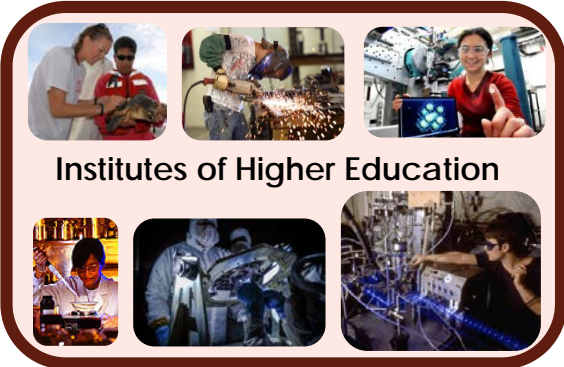
Formal PK-12 Education



Business Community



Institutes of Higher Education



Learner Centric



Government



Family



Out-of-School Programs





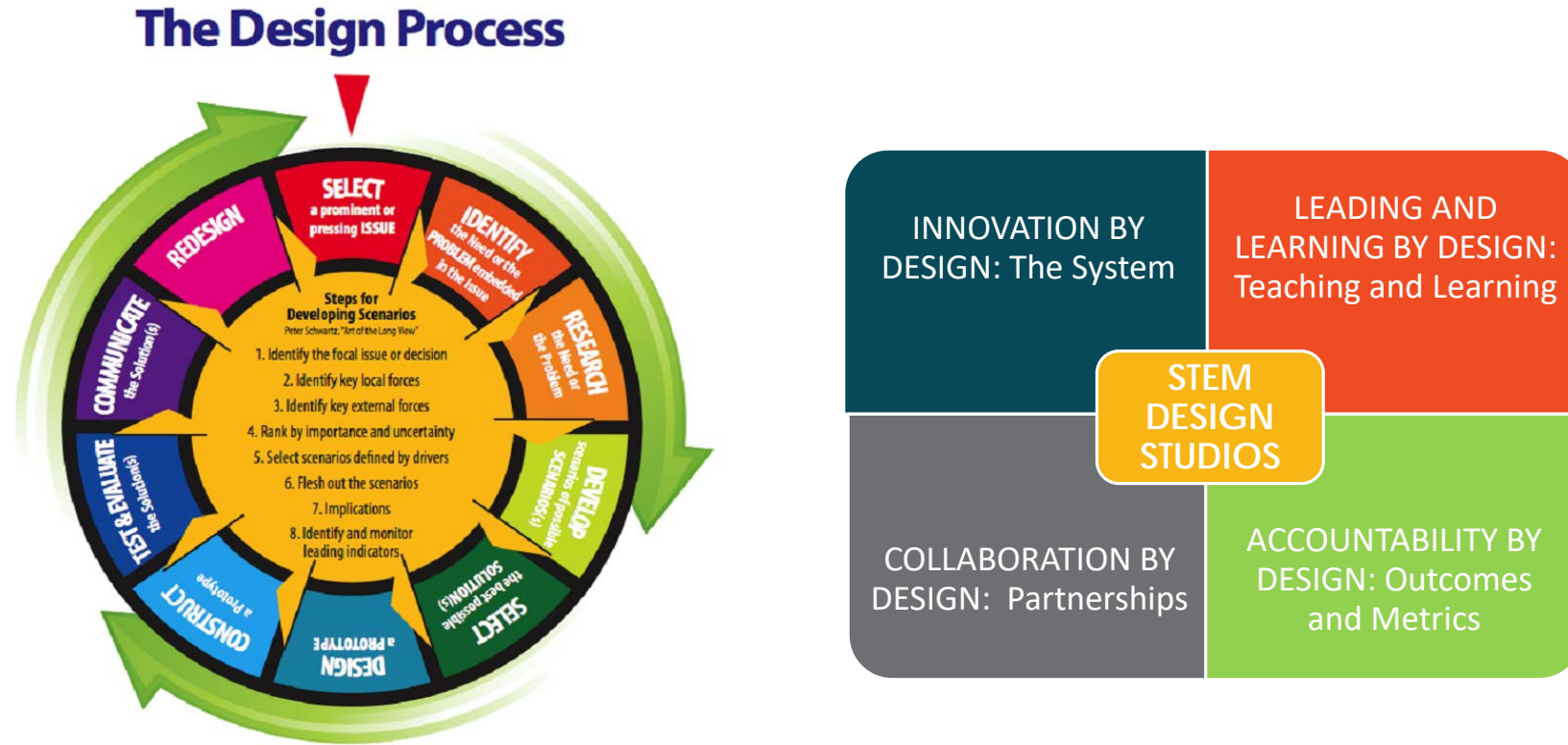
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THE "HOW" - ENGINEERING DESIGN

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HOW WE CULTIVATE A STEM LEARNING ECOSYSTEM



1. National Community of Practice
2. Technical Assistance/Community Coach

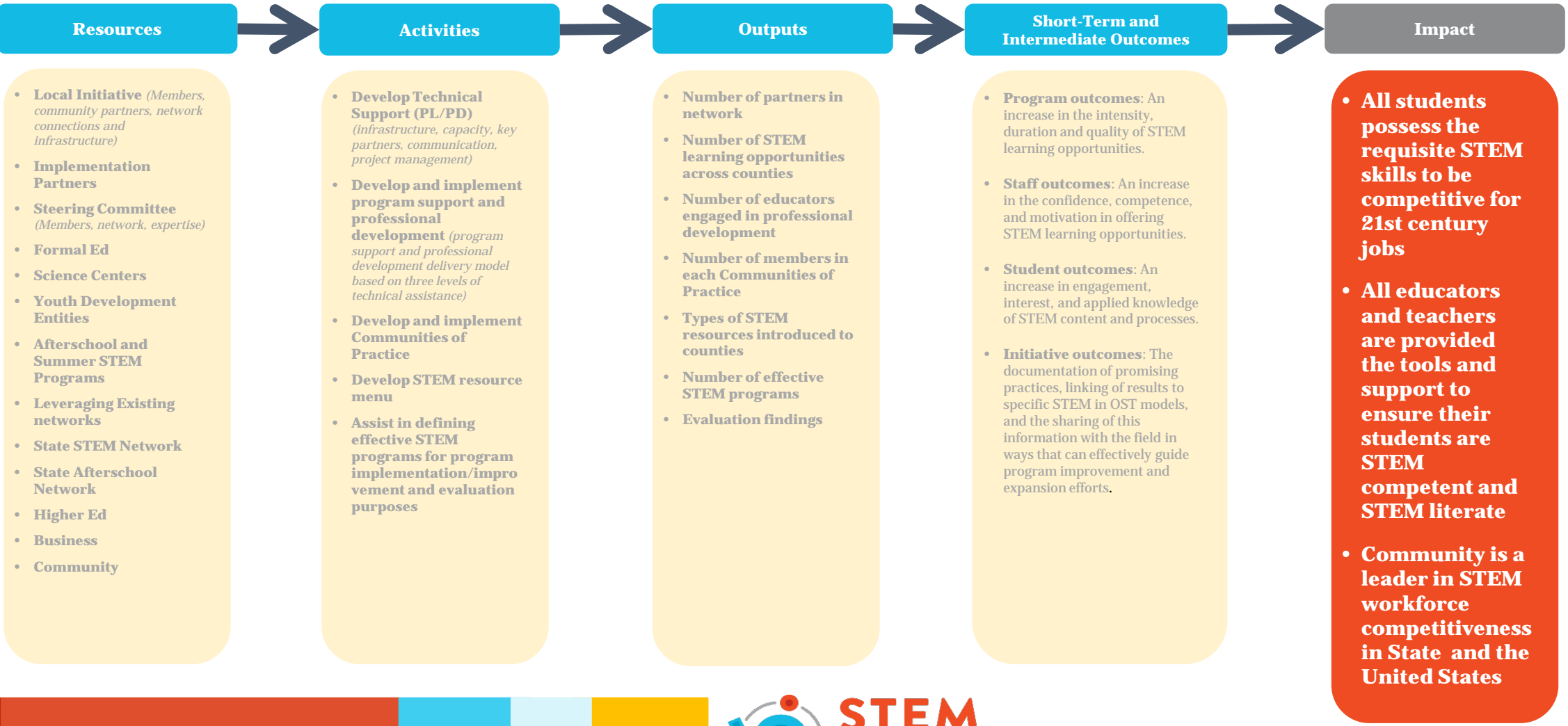


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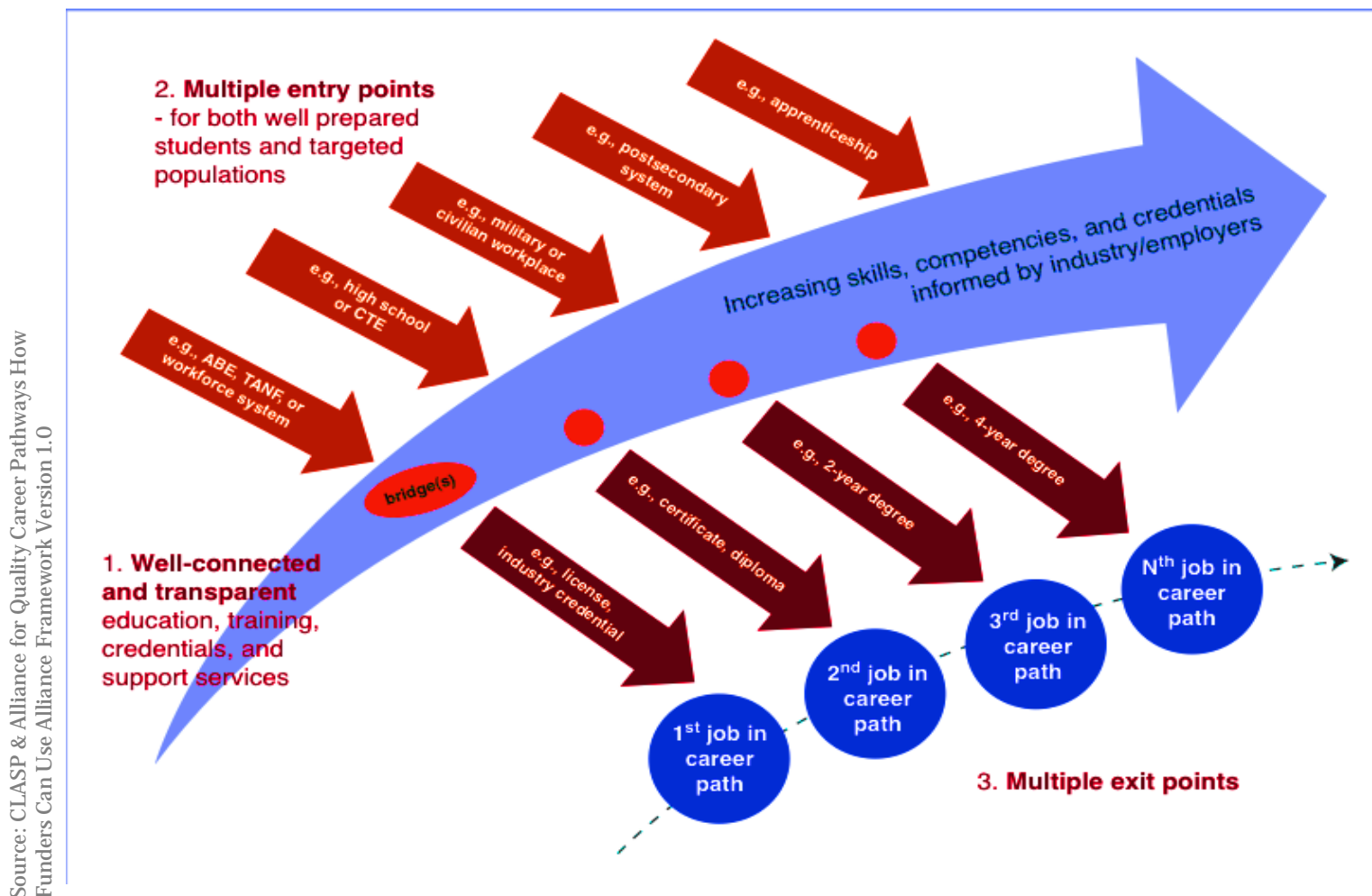
Cultivate. Learn. Innovate.

FOCUS – 3 CORE OUTCOMES



MULTIPLE ON AND OFF RAMPS

Figure 2: Three Essential Features of Career Pathways





Cultivate. Learn. Innovate.

MORE THAN A VISION....

IT'S TODAY'S REALITY!

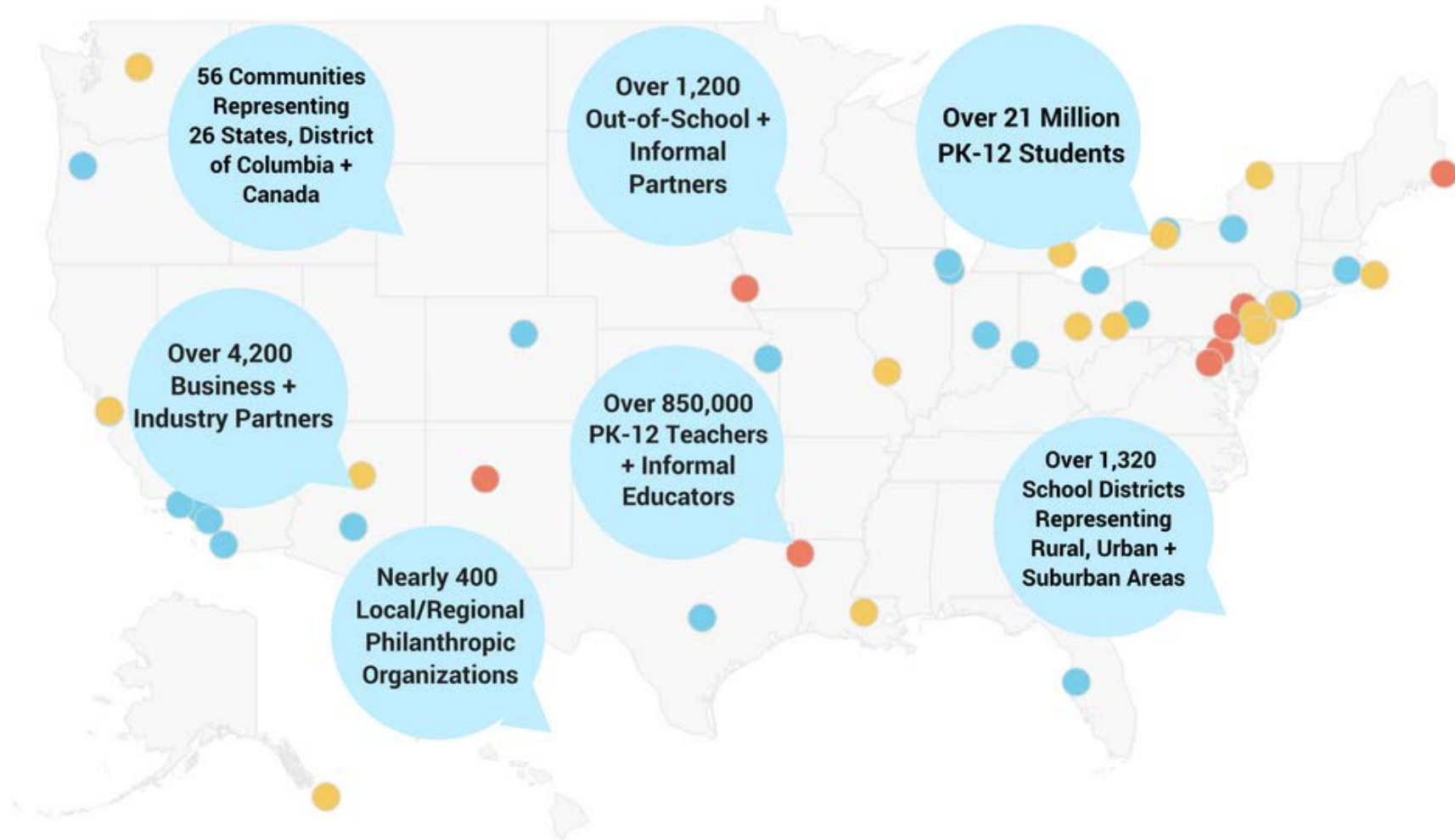
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YEAR 3: 56 STEM LEARNING ECOSYSTEMS

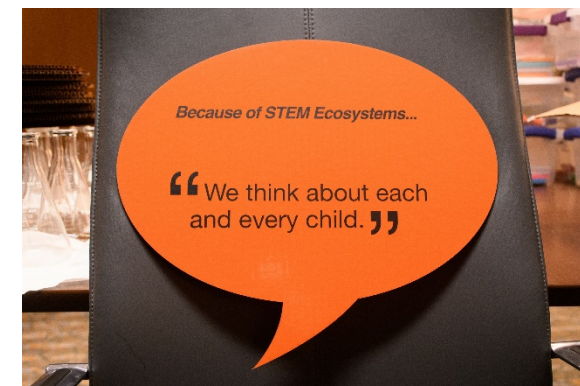
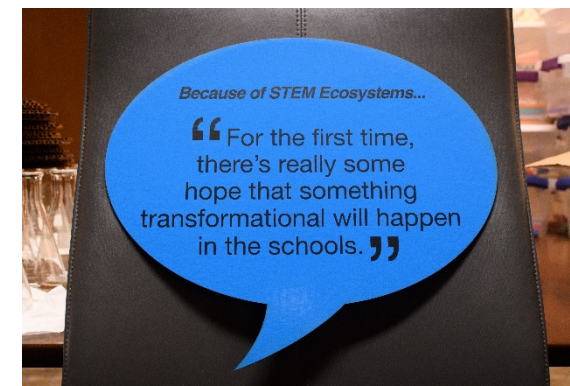
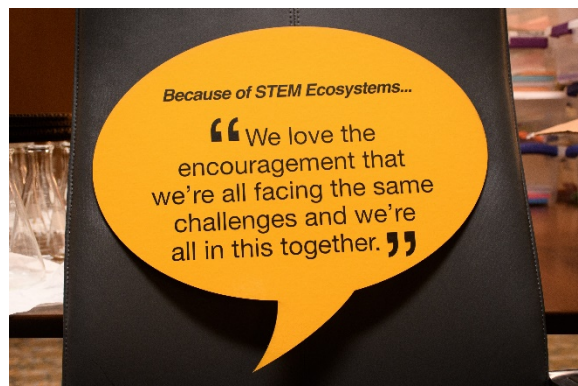
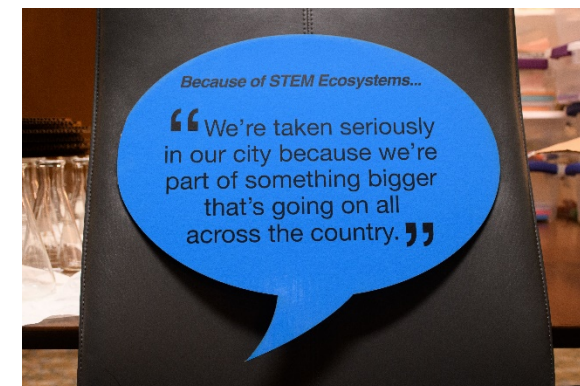
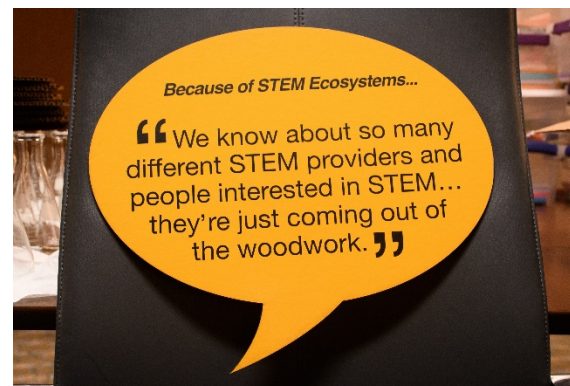


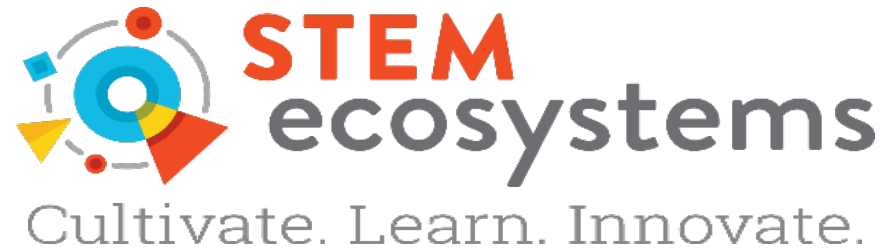
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BECAUSE OF STEM LEARNING ECOSYSTEMS





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