



# FUTURE skills ENTERPRISE

getting fit for a new kind of workforce



**The world is building a new kind of workforce:  
globally connected, technologically enhanced,  
and ready for change at a moment's notice.**

Over the next decade, organizations and the people who work in, for, and with them will need to acquire powerful new skillsets in five peak performance zones: Reputation Management. Human-Machine Collaboration. Pop-Up Enterprise. Sensemaking. Resilience.

Today, these skillsets are already redefining peak performance for enterprises of all kinds. They are not yet widely distributed—and certainly not equitably distributed. But over the next decade, they will become the new fundamentals for success.

This map is your guide to getting your organization and its workforce fit for this future.



# GETTING FIT FOR A NEW KIND OF WORKFORCE: 5 PEAK PERFORMANCE ZONES

## REPUTATION MANAGEMENT

### Seeing what's beyond resumes and credentials

The future is a digital universe with as many channels as humans can imagine. Workers will not only learn their skills in online courses and YouTube instruction videos. They will build reputations on unexpected platforms like Twitch and earn income from streaming their conferences and workshops, their crafts and even their daily lives on livestreaming sites around the world. They will tap algorithmic matching apps to find the one-in-a-billion task that's just right for them. They will ply new infrastructures like blockchain-built platforms to get credit for everything they do. They will find ways to turn their personal data into working assets with both monetary and non-monetary value. They'll create their own personal brands in labor markets that pop-up overnight as these platforms sort and re-sort the essential categories of global enterprise. Accounting? Manufacturing? Marketing? Look again.

In this future, reputation management is clearly not about the static resume and credentials earned a decade ago. It's a live daily process of learning, building visibility, and curating the stories that vast arrays of data tell the world about who we are and what we can do.

## POP-UP ENTERPRISE

### Scaling enterprise without the organization

The future, like the past, is about high-performance teams. But the high-performance teams of the future won't be bound by the borders of the enterprise, or even by global networks of enterprise partners. Nor will they be assembled and curated by skilled managers or top-notch HR departments. Instead, these will be ad hoc pop-up teams that find each other through algorithmic team building, as task matching software searches not for individuals skilled at micro-tasks but rather for teams skilled at complex, multifaceted tasks—teams that may or may not exist until the task hits the global marketplace.

These pop-up teams will redefine the enterprise of the future: think of this future enterprise as a hybrid branding agent plus investment firm, much like today's large film studios or even venture capital firms. The enterprise of the future will scale human activity around the world, with a focus on branding the work done by algorithmically curated teams.

## SENSEMAKING

### Navigating the complex realities of a high-resolution world

The coming decade will usher the world into a future of ubiquitous sensors producing masses of high-resolution data about people, processes, and environments. Data stores will grow 10 times as fast as the population, and this high-resolution world will challenge our human neural bandwidth. Workers and enterprises alike will scramble to make sense of this data, using digital algorithms and ever faster computer processing speeds to augment our human bandwidth and offload many of our cognitive tasks. They will depend on machine intelligence to discern patterns over a much broader temporal bandwidth. And then they will turn these into new narratives about our past, present and future. Big data will become a launching pad for big stories in every medium.

Ultimately, these high-resolution stories will change the very minds of workers. They will reorganize every field of endeavor from the microbe up. And along the way, they will reinvent what we call *enterprise* today.

Over the coming decade, enterprises and workers alike will need to build new skills in five peak performance zones. These are the zones that will make the difference between a strong workforce and one that's ill-prepared for the changes we all face. They are the starting place for building a new enterprise strategy for everything from recruiting and compensation to resource allocation and scaling innovation. Here's what to expect.

## HUMAN-MACHINE COLLABORATION

### Getting ready for user-generated intelligence

Over the next decade, advances in artificial intelligence will launch a new global economy of user-generated intelligence. This is the big story of artificial intelligence in the workforce. Yes, machine intelligence could displace 47% of the workforce over the next 20 years. Algorithmic task management will disrupt mid- and even high-level management jobs. And smart algorithmic augmented reality systems will teach workers to do complex physical and even social tasks in situ, in realtime. But these impacts will pale in comparison to what happens when building AI for a repetitive task becomes no more challenging than creating a Facebook page. Over the past couple decades, user-generated content has changed the face of media, marketing, and politics, launching a new media literacy. Over the coming decade, user-generated intelligence will change the way we think, plan, analyze, simulate, and build new worlds of trade, demanding a new AI literacy.

Human-machine collaboration in this future is more than just working out which humans and which machines do which jobs in the enterprise. It's about a Cambrian explosion in the ability of humanity to build enterprises of every kind, at every scale, tapping into machine intelligence that they themselves create.

## RESILIENCE

### Investing in an equitable economy

The human workforce—the people who turn labor into personal, organizational, societal, and even environmental wealth—face the riskiest future in recent memory. Workers at all levels of the enterprise are poorly skilled for the seismic shifts that are already underway in the structure of work. They depend on safety nets that are rapidly fraying. In the face of the most extreme income inequality since the middle of the 20th century, they lack the most basic skills in risk management. And even as they are pressed into ad hoc work, learning, and life choices, the long-term consequences of these choices are magnified by the scale of change. More and more, they find themselves in extreme environments, from migrant settlements to post-disaster communities that undermine their ability to acquire the skills that could help them build a resilient future for themselves.

In this high-risk future, the task before *enterprise* as a verb is to reimagine the way we use all kinds of assets, both human and machine—in both the physical and digital worlds—to rebuild equity as perhaps the most important bulwark against the risks of extreme environments, extreme politics, and extreme technological solutions. Building equity, in both meanings of the word, is perhaps the ultimate skill of human enterprise.



**As enterprises of all kinds develop strategies to get fit for these peak performance zones, they will find themselves driven by four imperatives of this future: the need to innovate, to learn continuously, to build sustainable platforms for enterprise, and to secure the well-being of their workers and the larger publics they serve.**

These needs will, in turn, drive diverse strategies—different optimization pathways—for skill building. To achieve peak performance, enterprises will each forge their own winning pathways through the performance zones, choosing the optimization strategies and the skills that, in the end, add up to a new #futurefit workforce. Here's the far-reaching workout plan.

STRATEGIES & SKILLS THAT OPTIMIZE FOR:

# INNOVATION

# LEARNING

# SUSTAINABILITY

# WELL-BEING

**REPUTATION MANAGEMENT**

**Build a reputation for creativity**

**PERSONAL FANS**  
Grow the art of the fan base to develop unique clusters of personal followings that create individual reputational pathways

**DEEP DIVERSITY**  
Develop strategies for working with deep diversity—differences in personality, values, and attitudes that go beyond demographic stereotypes

**SHAPESHIFTING**  
Foster a shapeshifting identity to engage the world from different perspectives in any context

**Make every learning moment count**

**REAL-TIME CREDENTIALS**  
Navigate the evolving systems designed to provide micro-learning experiences and award credit for them

**CURATED LIFESTREAMS**  
Learn to capture and curate the continuous flow of experience that adds up to learning to create compelling reputations

**GITHUB RESUMES**  
Master the protocols of open-source solution networks like the coding platform GITHUB to build and demonstrate competencies and connections

**Master the art of shared reputation pathways**

**SCALABLE BRANDS**  
Foster the ability to create flexible, distinctive personal brands that build larger team, organization, and even community brands

**PSEUDONYMOUS PROFILES**  
Master the art of managing reputational pathways with tools that preserve privacy while affirming task-specific competencies

**GROUP EXPERTISE**  
Learn to create trusted knowledge by building diverse associations of experts whose shared reputations are considered evidence of expertise

**Cultivate new biological identities**

**BODY TRACES**  
Develop practices and protocols for managing the new markers of biological reputation from genetic tests to wearable sensors and facial recognition systems

**SPECTRUM IDENTITIES**  
Learn to recognize and leverage the evolving spectrums of identity—for gender, race, and mental health, for example—to express truly personalized well-being

**SYNTHETIC BODIES**  
Tap the evolving science of synthetic personas to discern new categories of human “types” and how to use them to manage well-being

**HUMAN-MACHINE COLLABORATION**

**Promote a culture of DIY AI**

**USER-GENERATED INTELLIGENCE**  
Grow the skill base of DIY AI development to do things that users have never before been able to do, think, or even imagine

**API ARTS**  
Perfect the art of creating new value from diverse platforms by using their APIs to repurpose them in unexpected ways

**SIMULATED SOLUTIONS**  
Expand the ability to problem-solve with simulation skills that make it possible to test thousands of alternative solutions for every problem

**Leverage smart learning tools**

**RECOMMENDER LEARNING PATHS**  
Master Netflix-style AI-recommender systems to identify personalized learning paths based on crowdsourced patterns

**REAL-TIME INSTRUCTION**  
Engage in continuous learning with augmented reality tools that provide just-in-time instruction for real-world work tasks

**LEARNING BOTS**  
Learn to design personal bots that not only help with fundamental learning processes such as search or organizing data but also learn to improve themselves and their users

**Develop a practice of augmented optimization**

**SMART MANUFACTURING**  
Learn to build sustainability objectives into the robots and intelligent software that source, produce, and deliver physical goods

**SMART CONTRACTS**  
Develop a literacy of smart digital contracts that set multiple contract conditions to optimize transactions for sustainability goals

**VIRTUAL DASHBOARDS**  
Master the design and use of intelligent digital dashboards to optimize group decision-making aimed at specific ecosystem goals

**Perfect the body's feedback loops**

**BODY MONITORS**  
Master the strategic use of continuous body monitoring to manage personal well-being and share body data in exchange for meaningful rewards

**AUGMENTED PERFORMANCE**  
Foster the use of AI “personal trainers” that track body sensors to provide guidelines for developing peak physical and mental performance

**PREDICTIVE ANALYTICS**  
Integrate simulations of the future body, based on current sensor data, to anticipate health challenges and develop healthy life strategies

**POP-UP ENTERPRISE**

**Master the art of pop-up prototyping**

**MAKER TEAMS**  
Expand team skills to launch ad hoc global maker teams that can tap unique resources—and visions—for rapid small-scale manufacturing

**BRANDED TASKS**  
Cultivate multiple niche competencies to pivot expertise rapidly and solve small parts of big puzzles in global design-and-development networks

**IoT VALUE**  
Master the discipline of curating value from sensors embedded in people, places, and objects—often using blockchain-style technologies

**Create new value with learning currencies**

**PERSONAL CURRENCIES**  
Master the use of digital currencies to create personal valuations of one’s learning, skills, and connections

**INCENTIVE PORTFOLIOS**  
Develop the skills to manage multiple learning incentives and the tools for tracking and measuring them

**LEARNING EARNINGS**  
Build proficiency in business models that combine learning tasks with productive tasks to return money or services to learners (or an enterprise)

**Use open networks to minimize pop-up risk**

**TEAM HIRING**  
Cultivate a practice of building and hiring multi-skilled freelance teams, as opposed to building teams from scratch, to accomplish complex high-risk tasks

**ASSET-SHARING**  
Build on the lessons of the shareable economy to increase network access to a wide range of work+learn resources typically provided by institutions

**SAFE SPACES**  
Learn to create bottom-up, ad hoc community work+ learn spaces in a wide variety of extreme environments, from disaster zones to migrant settlements

**Prepare for a world of bio-coordination**

**STIGMERGY**  
Master the science of stigmergy to use passive and active signaling from bio-sensors to coordinate complex interactions without a coordinator

**ECO-EXCHANGE**  
Leverage broad use of sensor data and digital currencies to create exchanges for ecosystem services, such as carbon currencies for carbon exchanges

**BIO-MAKING**  
Master the tools and ethics of bio-engineering in the fast-evolving world of computerized gene editing and bio-programming

**RESILIENCE**

**Look beyond novelty**

**ASSET FLIPPING**  
Develop a practice of reimagining existing, often under-used assets as new sources of value

**DILEMMA FLIPPING**  
Build the craft of transforming problems and obstacles into innovation streams by changing the context

**DEEP RESILIENCE**  
Learn to apply high-resolution data to simulations of innovations to determine their future impacts

**Value learning to learn**

**SELF-DISCOVERY**  
Discover the learning pathways that produce the most effective learning—with both monetary and non-monetary rewards—as a foundational skill

**LEARNING RECIPES**  
Develop or crowdsource recipes for learning to learn as well as learning communities to support them

**LEARNING ATTITUDES**  
Cultivate attitudes that encourage learning, such as curiosity, passion, flexibility, self-advocacy, entrepreneurial imagination and a willingness to fail

**Expand temporal bandwidth**

**HISTORICAL LITERACY**  
Build a continuous learning path to discover the long history of current challenges to sustainability and the foundational priorities of enterprise

**FUTURES IMAGINATION**  
Foster an integrated practice of futures imagination with such tools as scenarios, artifacts from the future, and foresight games

**SOCIAL DILEMMAS**  
Learn to resolve social dilemmas by investigating long-term consequences versus short-term benefits—and vice versa

**Preskill for the evolutionary organization**

**EMPATHY**  
Develop deep empathy as a key tool in managing complex transformations without violence

**EMOTIONAL ADAPTABILITY**  
Learn to integrate the neuroscience of emotions into strategy and policy for adaptive changemaking

**CO-EVOLUTION**  
Foster an understanding of co-evolutionary processes for reinventing the social systems of enterprise for a healthier, more equitable future

**SENSEMAKING**

**Leverage the science of the big story**

**ALGORITHMIC DATA**  
Develop a literacy of big data to uncover the meaningful stories in high-resolution data—and to understand the way algorithms can shape them

**NARRATIVE NEUROSCIENCE**  
Deploy an understanding of the neurological foundations of storytelling to connect big data to human-scale experience

**IMMERSIVE STORIES**  
Extend neuro-based storytelling strategies into new immersive media like virtual and augmented reality to experience big data in new ways

**Master complexity with games**

**CROWDSOURCED SIMULATION**  
Leverage the engagement of games to simulate complex worlds, both real and fictional, while mastering the laws of physics and biology

**COLLABORATIVE DESIGN**  
Build on the collaborative skills of massively multi-player games to design, analyze, and ultimately implement complex systems

**COGNITIVE ECOSYSTEMS**  
Grow skills in creating cognitive ecosystems of AI, VR, and game mechanics to solve large-scale complex problems

**Embrace volatility with continuous sensemaking**

**URGENT FUTURES**  
Develop a personal and collective practice of anticipating and prioritizing the most urgent futures to apply and grow individual and group competencies

**DIGITAL TWINS**  
Master the ability to use digital renditions of physical systems, from human bodies to cities to watersheds, to manage constantly changing conditions and capacities

**UBIQUITOUS CHANGEMAKING**  
Learn to see every medium, from social media to food, as a medium for managing change for a more sustainable world

**Master the science of the superorganism**

**BIG BODY DATA**  
Learn to make the connections between personal human body data and high-resolution environmental data to drive an understanding of the superorganism

**ENVIRONMENTAL GENETICS**  
Foster a practice of environmental monitoring using low-cost genetic sensors to discern the patterns of millions of species in any ecosystem

**BIOLOGICAL ORGANIZATIONS**  
Develop models of organizations as biological organisms to manage the health of the organization at its biological roots

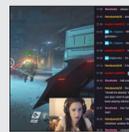


## REPUTATION MANAGEMENT

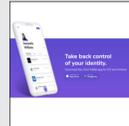
<b>CREATIVE REPUTATION</b>	personal fans	deep diversity	shapeshifting
<b>MOMENT-BY-MOMENT LEARNING</b>	real-time credentials	curated lifestreams	github resumes
<b>SHARED REPUTATION PATHWAYS</b>	scalable brands	pseudonymous profiles	group expertise
<b>NEW BIOLOGICAL IDENTITIES</b>	body traces	spectrum identities	synthetic bodies

### ORGANIZATIONAL SHIFTS

Boundaries  
Synchronization  
Recruitment  
Compensation



Twitch gamers build incomes by growing their fan base with personal brands



Upport is a blockchain-based identity management service that collects credentials as you go

## lobe

Teach your app to see emotion

Build, train, and ship custom models using a simple visual interface

Lobe.ai is a drag-and-drop tool to build and train AI apps



Playment is a game-like platform where humans earn cash by training machines

## HUMAN-MACHINE COLLABORATION

<b>DIY AI</b>	user-generated intelligence	API arts	simulated solutions
<b>SMART LEARNING</b>	recommender learning paths	real-time instructions	learning bots
<b>AUGMENTED OPTIMIZATION</b>	smart manufacturing	smart contracts	virtual dashboards
<b>EMBODIED FEEDBACK</b>	body monitors	augmented performance	predictive analytics

### ORGANIZATIONAL SHIFTS

Planning  
Resource Allocation  
Synchronization

## POP-UP ENTERPRISE

<b>POP-UP PROTOTYPING</b>	maker teams	branded tasks	IoT value
<b>LEARNING CURRENCIES</b>	personal reputation currencies	incentive portfolios	learning earnings
<b>POP-UP RISK</b>	team hiring	asset sharing	community spaces
<b>BIO-COORDINATION</b>	stigmery	eco-exchanges	bio-making

### ORGANIZATIONAL SHIFTS

Resource Allocation  
Scaling  
Boundaries  
Synchronization  
Recruitment  
Compensation



Elevator is an AI-assisted platform for workers to assemble themselves as teams



Local Motors engages the crowd to design dream cars and share profits



# FUTURE skills ENTERPRISE

getting fit for a new kind of workforce

## SENSE MAKING

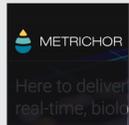
<b>BIG STORIES</b>	algorithmic data	narrative neuroscience	immersive stories
<b>COMPLEXITY GAMES</b>	crowdsourced simulation	collaborative design	cognitive ecosystems
<b>CONTINUOUS SENSEMAKING</b>	urgent futures	digital twins	ubiquitous changemaking
<b>SUPER-ORGANISM</b>	big body data	environmental genetics	biological organizations

### ORGANIZATIONAL SHIFTS

Planning  
Resource Allocation  
Boundaries



Minecraft is a platform for collaborative design and simulation of complex systems



Metrichor supports global communities in real time analysis of environmental genetic data



PersonaPanels uses machine learning to generate animated "synthetic" personas from big data.



FutureLearn is a social learning platform where learners and experts share study tips

## RESILIENCE

<b>NOVELTY+</b>	asset flipping	dilemma flipping	high-resolution resilience
<b>LEARNING TO LEARN</b>	self-discovery	learning recipes	learning attitudes
<b>TEMPORAL BANDWIDTH</b>	historical literacy	futures imagination	social dilemmas
<b>EVOLUTIONARY ORGANIZATION</b>	empathy	emotional adaptability	co-evolution

### ORGANIZATIONAL SHIFTS

Planning  
Scaling  
Synchronization  
Recruitment  
Compensation

## 5 PEAK PERFORMANCE ZONES

Winning organizations know all about peak performance. They work at it every day. But as the **social, technological, economic, environmental,** and **political** landscapes shift—sometimes called the **STEEP** shift—the important performance zones will shift, too. This map is a workout plan to help organizations and the larger workforce get fit for the shift.

- REPUTATION MANAGEMENT
- HUMAN-MACHINE COLLABORATION
- POP-UP ENTERPRISE
- RESILIENCE
- SENSEMAKING

## 7 ORGANIZATIONAL SHIFTS: new ways to get things done

Organizations are a social technology—a means of getting things done, creating economic value, and maintaining social order and cohesion. The **STEEP** shift of the coming decade will transform the way we get things done, and **seven key organizational shifts** lay the tracks for the strategies and skills that will be required in each peak performance zone.

**Planning** from periodic strategic plans to continuous feedback loops  
> SENSEMAKING | RESILIENCE | HUMAN-MACHINE COLLABORATION

**Resource allocation** from management structures to process design  
> HUMAN-MACHINE COLLABORATION | SENSEMAKING | POP-UP ENTERPRISE

**Scaling** from growing staff to connecting networks of contributors  
> POP-UP ENTERPRISE | HUMAN-MACHINE COLLABORATION | RESILIENCE

**Boundaries:** from securing closed systems to branding open systems  
> POP-UP ENTERPRISE | REPUTATION MANAGEMENT | SENSEMAKING

**Synchronization:** from co-located employees to distributed coordination of remote freelancers  
> POP-UP ENTERPRISES | REPUTATION MANAGEMENT | HUMAN-MACHINE COLLABORATION

**Recruitment:** from filtering resumes to tapping into reputation streams  
> REPUTATION MANAGEMENT | POP-UP ENTERPRISE | RESILIENCE

**Compensation:** from monetary rewards to portfolios of incentives  
> POP-UP ENTERPRISE | RESILIENCE | REPUTATION MANAGEMENT

## 4 PATHS TO OPTIMIZATION

As a social technology, organizations can optimize for many different outcomes to meet their enterprise goals. The imperatives of a world undergoing rapid change will drive four winning paths to optimize enterprise for a stronger future for everyone.

- INNOVATION** may be the defining pathway for organizations and workers who want to be at the forefront of creative disruption and new value creation.
- LEARNING** may be the path of choice for organizations and workers who want to build a strategic advantage by quickly adapting to continuous changes in the environment.
- SUSTAINABILITY** may be the driving motivation for organizations and workers who want to secure a long-term future not only for themselves but for coming generations.
- WELL-BEING** may frame the strategic choices of organizations and workers who build their value in the economy by contributing to the overall health of society.

## HOW TO USE THIS MAP

# LET'S GET STARTED

This map is a guide to five peak performance zones for the future workforce—zones that will help build strong enterprises as the workforce undergoes massive transformations in the coming decade. Think of it as a workout plan to get fit for this new world of work—with three steps to get you started.

### 1. Design a zone strategy for you and your organization

Start by getting to know the five peak performance zones. Read the description of each zone. Explore the fitness strategies for your starting-place zone. Then choose a function in your organization—maybe it's recruitment or communications or new product development. Think about the ways you might redesign the function to implement the map strategies. Then identify the most important skills you'll need both within your organization and in the larger workforce to make your strategy a success. Make a plan to build peak performance with those skills.

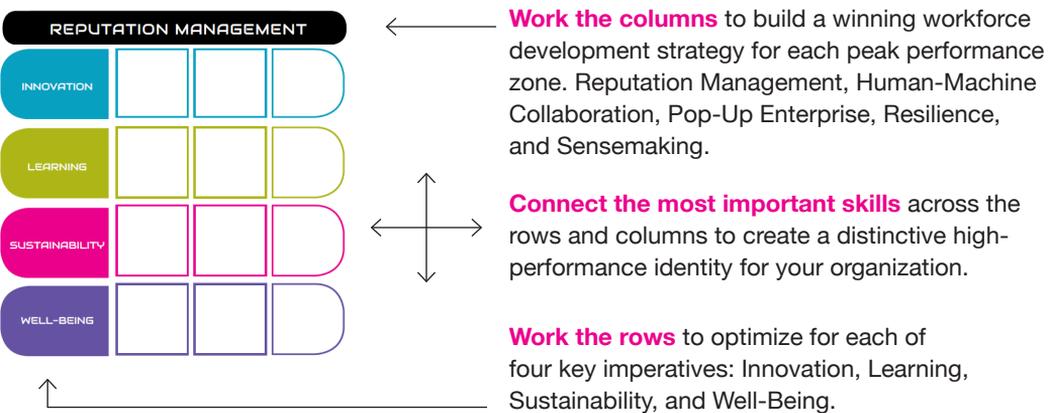
### 2. Choose an optimization pathway and STRATEGIZE!

The map lays out four paths to optimize the workforce for a stronger future, each with a different primary imperative: Innovation, Learning, Sustainability, and Well-Being. Choose one of these paths (the rows on the map) and optimize your enterprise by creating scenarios for reinventing its core functions and workforce with the strategies and skills along this path.

### 3. Connect the dots to build your enterprise identity

Build a new identity from the bottom up by selecting 5-7 future skills across the five peak performance zones on the map and asking: what kind of enterprise would we be if these were our core competencies? Try out different combinations of skills to build on your current competencies and to explore the ways that adding two or three new competencies might transform your enterprise. Then design a workout plan for building peak performance to create the most compelling future for your workforce.

**Be sure to explore IFTF's companion maps** to build your understanding of the peak performance zones and organization shifts: *Future Skills: Get Fit for What's Next* and *Beyond Organizations: New Models for Getting Things Done*.



50  
YEARS

#### For more information:

Parminder Jassal | [pjassal@iftf.org](mailto:pjassal@iftf.org)

INSTITUTE FOR THE FUTURE | [www.iftf.org](http://www.iftf.org)