TORTORA BRAYDA
PARTNERSHIP EXCELLENCE

The Human Talent Gap in Cyber Security and Artificial Intelligence

World Café on 26 January 2021

Summary Report

CYBER RESILIENCE AND AI COUNCILS WORLD CAFE

The **Human Talent Gap in Cyber Security and Artificial Intelligence World Café**, held on 26 January 2021, provided a platform for exchanges amongst the members of the **Cyber Resilience and AI Councils** of the **Tortora Brayda Partnership Excellence**, and other industry players**.**

The session was hosted **by Carlo Tortora Brayda di Belvedere, Founder and Chairman of the Tortora Brayda Partnership Excellence**.

The meeting featured two Keynote Speakers who set the context for the event:

- **MK Palmore, CISM, CISSP, Vice President Field Chief Security Officer, Palo Alto Networks**

- **Will Markow, Managing Director, Burning Glass**

Over 30 participants: academics, entrepreneurs, data scientists, engineers, HR professionals, cybersecurity and military experts engaged actively in vibrant conversations and produced more than hundred ideas and concrete solutions to address the talent gap in cybersecurity and artificial intelligence.

The World Café collaborative meeting was designed and facilitated by **Saba Imru-Mathieu, CEO, Leaders Today**, Geneva, Switzerland.

Highlights from Carlo Tortora Brayda's opening remarks

- A warm welcome to all the participants who are assembled to discuss a theme of gravity and importance.
- The extensive human talent gap in cybersecurity and artificial intelligences puts the US in peril economically and in terms of defense.
- This is a global problem; the gap is growing also in other countries, such as India, who sources talent to the US.
- The needs in terms of data scientists, engineers and commercial experts may not be met in the short term.
- The talent gap slows down the growth and pace of innovation and entrepreneurship needed to remain safe and competitive on the world stage.
- A thriving economy can only exist if it is secure and trusted.
- The lack of investment and innovation in cybersecurity and AI can endanger national security.
- Making this a priority is essential for the US to retain its global leadership.

"

Whenever you bring about people with different views, expertise and perspectives, you end up achieving things that you couldn't do individually, because no one person has the entire picture.

"

KEYNOTE SPEAKER
MK Palmore, Vice President, Palo Alto Networks

Key points from MK Palmore's keynote

- There are millions of open jobs in the cyber security field, this keynote will be about how we work to fill some of these through the inclusion and diversity lens
- MK Palmore recounted his personal and professional story of accessing university, the US Service academy, the FBI and Silicon Valley tech, despite all these fields offering scarce access to minorities.
  - In addition to his work at Palo Alto Networks, MK volunteers in **International Consortium for Minority Cybersecurity Professionals**, a non- profit dedicated to increasing the presence of women and minorities in cybersecurity.
  - He is thus aware of the existing challenges as he observes the lack of people of color and women in cyber security.
  - The lack of diversity is disheartening for anyone wanting to join this field of work.
- Diversity and inclusion are key to closing the human talent gap.
- It is important to raise awareness, make the field more attractive and accessible to young people, demystify the need for only the highest credentials.
  - It's essential to expose students to cyber security and AI by creating new educational opportunities, including foundation courses.
  - Start cyber security career path awareness and training as early as possible, and at the very least from as early as from high school.
- Work with non-profits to reach more people and continue engaging in open dialogue in groups of passionate professionals.

> **" If I can move the needle for a handful of individuals, ones that I have an opportunity to personally touch and engage with, then I've done my part in terms of changing. "**

Will Markow, Managing Director, Burning Glass

Key points from Will Markow's keynote

- Cyber security and AI jobs remain some of the hottest careers in the market and they're also some of the most important
- From a national security and economic development standpoint, it's cardinal to ensure we have enough workers to fill those jobs
  - There's an urgent need to build the next generation of Cyber Security and Artificial Intelligence to ensure the security the of the country's economy and digital infrastructure
  - We need more robust information about careers in these fields
  - Work with training providers and employees
- Burning Glass looks at 50,000 different online job boards every day, pulls job postings down and runs them through an AI engine to build a comprehensive and nuanced picture of the cyber security and AI job markets
  - There are 200,000 job openings yearly for AI jobs, and this will increase by 70% in the next 5 years
  - The human talent gap is huge, it would need to grow by 900,000 individuals immediately in the US alone
  - Lack of qualified talent pushes salaries up in cyber security, and even more in AI
  - There's a need to expand the talent pipeline

"
We can give people detailed and actionable recommendations for what steps they can take and what skills and credentials they can develop in order to qualify for these jobs, and unlock more opportunities in both cybersecurity and AI. "

Opening Statements - Recap

GOALS FOR THE WORLD CAFE

- Offer a platform to Council members to exchange with peers and industry players on key solutions to bridge the human talent gap in Cyber Security and Artificial Intelligence

- Foster a thought-provoking dialogue in a multi-stakeholder context and identify solutions

- Envision next steps for the Council to carry this reflection forward

- Forge and strengthen partnerships and alliances

OVERALL FIGURES

The meeting was held online with over 30 participants

- 2 Keynote speakers

- 9 organizers and facilitation team members

- 3 small group conversation rounds to discuss 3 strategic questions

- 2 plenary sessions

- Duration 3 hours and 30 minutes

- A total of 105 ideas and actionnable proposals were generated

MEETING METHODOLOGY

- The meeting was conducted in The World Café format, a highly collaborative meeting methodology that allows engagement by all participants and the collection of a large number of insights in a compact time-frame.

- Participants had the opportunity to discuss privately in small groups of four, as well as openly in plenary session during the town hall segments.

- A graphic record of the key insights emerging from the discussions was drawn live and presented to the participants during the session.

PROGRAM

8:00 am – 11:00 am PST

  * Introduction

  * Conversation 1 in break-out rooms (30 min) – Identify key solutions

  * Conversation 2 in break-out rooms (30 min) – How might you contribute

  * Short break

  * Town Hall (20 min)

  * Conversation 3 in break-out rooms (20 min) – Exploring partnerships

  * Town Hall (20 min)

  * Conclusions

11:00 – After the world café, break-out rooms were held for further networking and membership queries

Before starting the world café, participants determined what they considered to be the qualities of a good conversation.

PRESENTATION OF THE OUTCOMES

The next slides present the outcomes of the World Café conversations from different angles:

- The full graphic record of all the World Café outcomes

- The list of categories under which the outcomes were grouped

- A chart representing the category distribution for all outcomes

- Outcomes by Conversation
    - List of categories
    - Chart representing the category distribution
   - Summary of the outcomes

OVERALL OUTCOME CATEGORIES

The **105** ideas expressed by the participants during the world café were grouped under these categories:

Categories	Overall
Academia	4
Alternative Learning Paths	26
Apprenticeships & Mentoring	10
Artificial Intelligence	8
Awareness	4
Career	10
Channel	2
Diversity & Inclusion	8
Funding	2
Hiring Practices	18
Partnerships	9
Standards	4
Total:	**105**

OVERALL CATEGORY DISTRIBUTION

Standards 4%
Academia 4%
Partnerships 8%
Alternative Learning Paths 25%
Hiring Practices 17%
Apprenticeships & Mentoring 9%
Funding 2%
Diversity & Inclusion 8%
Artificial Intelligence 8%
Channel 2%
Career 9%
Awareness 4%
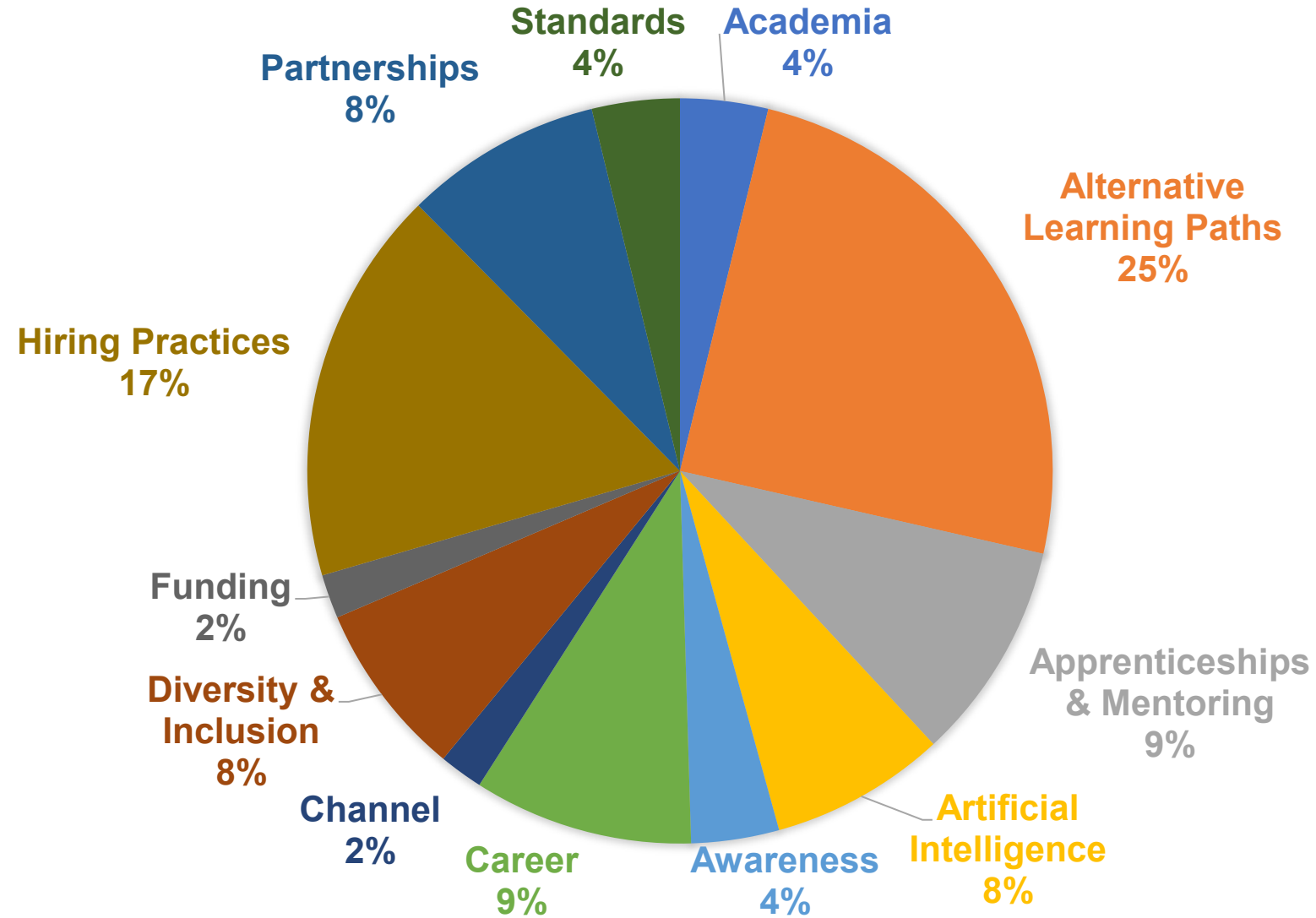
In Conversation 1, participants identified the key solutions needed to close the talent gap.

They gathered in break-out rooms to engage in small group conversations and explored the following question:

Question 1:

What innovative and robust solutions can be brought to close the talent gap in cybersecurity and AI?
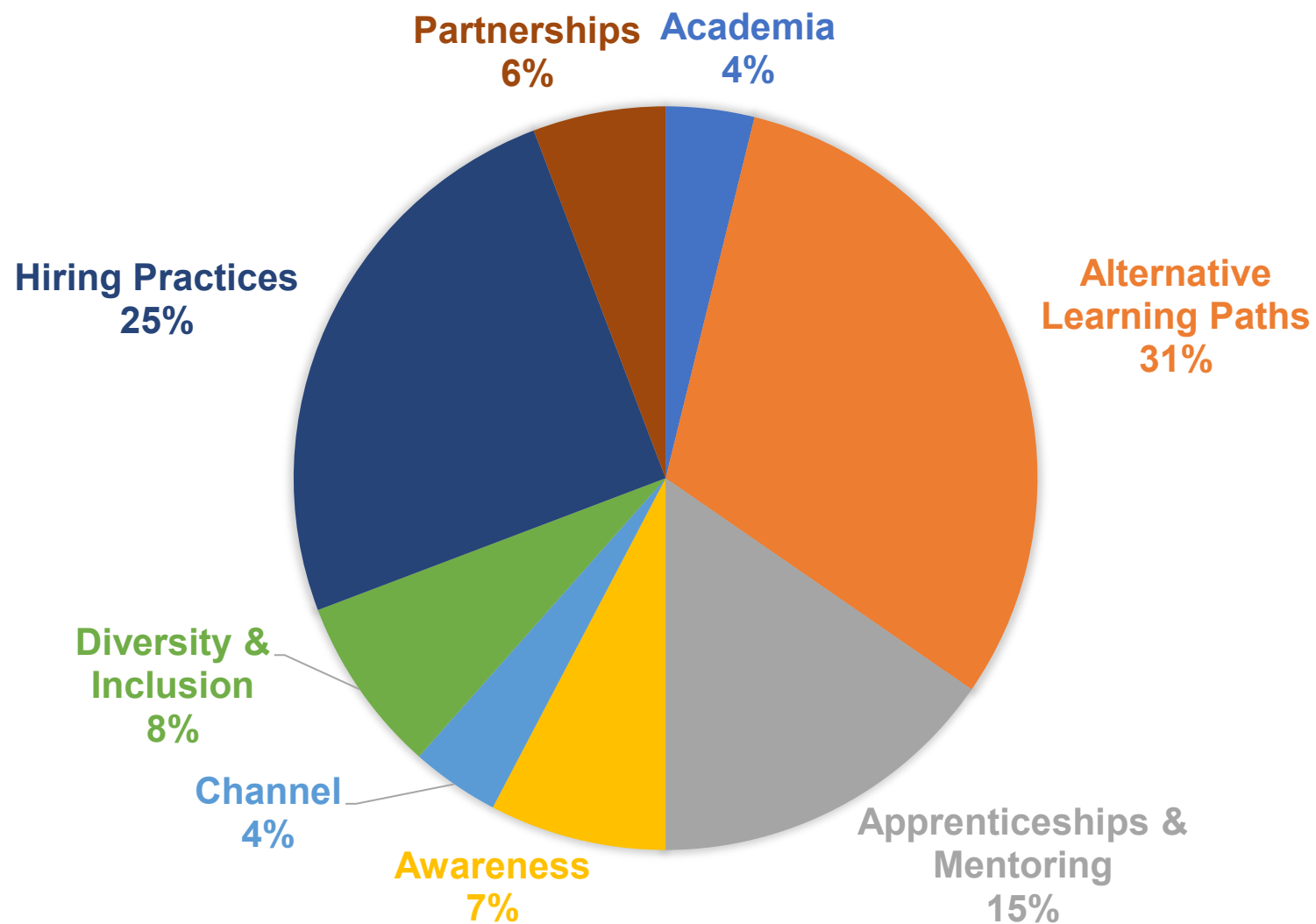
CONVERSATION 1 – SOLUTIONS
LIST OF CATEGORIES

The ideas expressed by the participants during Conversation 1 were grouped under these categories:

Categories	Conversation 1
Academia	2
Alternative Learning Paths	16
Apprenticeships & Mentoring	8
Awareness	4
Channel	2
Diversity & Inclusion	4
Hiring Practices	13
Partnerships	3
Total:	**52**

CONVERSATION 1 – SOLUTIONS CATEGORY DISTRIBUTION

Partnerships 6%
Academia 4%
Alternative Learning Paths 31%
Hiring Practices 25%
Diversity & Inclusion 8%
Channel 4%
Awareness 7%
Apprenticeships & Mentoring 15%
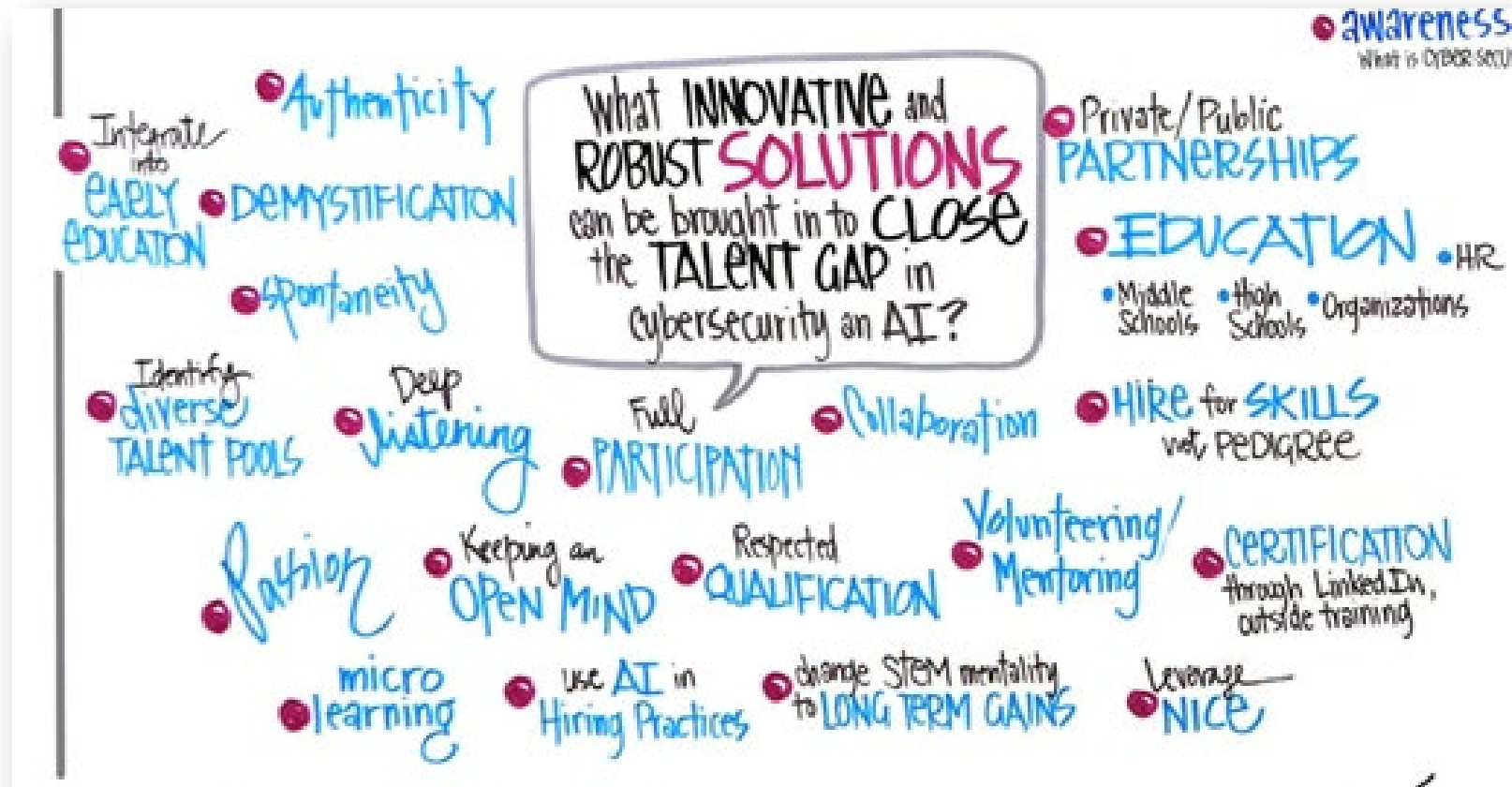
Participants identified numerous innovative and robust solutions to close the human talent gap in Cyber Security and Artificial Intelligence

Solutions in Academia

- Academic institutions need to collaborate with Industry to define true needs, need to standardize cyber security and AI curriculum, and should provide upskilling and continuing education to keep up with the rapidly evolving field.
- Open education to non-traditional students, to people in career transition, to a wider talent pool

Solutions through alternative learning paths – outside of degree plans

- Professional certifications, vocational training, short courses
- Employers to train talent from within
- Utilize mentoring and apprenticeship programs
- Start cybersecurity and AI education early, in middle and high school
- Gamify Cyber Security and AI to make them more exciting and attractive to the public
- Reduce costs of education
- Locate new technology schools in areas of large minority groups

Awareness and Information
- Raise awareness early, in middle school, high school and to the general population
- De-mystify the field through information and make it attractive
- Provide access to resources and clearer information on Cyber Security and AI
- Encourage young people to consider tech as a career, including girls and people from minorities
- Present STEM in a new way, more attractive (through a TV series, gamification)

Hiring practices
- Lower expectations regarding "top talent", the bar is too high at entry level
- Update recruitment mechanisms to include certifications and specific training, not only degrees
- Educate HR to write up-to-date job descriptions based on relevant industry needs
- Hiring should include policies on diversity and inclusion to ensure that minorities and women are recruited
- Use sales channels to fund and intake talent

Partnerships
- Multiply government and private sector and academia and industry partnerships
- Participation of the government is critical to include cybersecurity in the curriculum at high school or university levels

In Conversation 2, participants articulated how they might contribute to closing the talent gap.

They gathered in break-out rooms to engage in small group conversations and explored the following question:

Question 2:

What role can you, your profession, or your organization play in closing the talent gap?
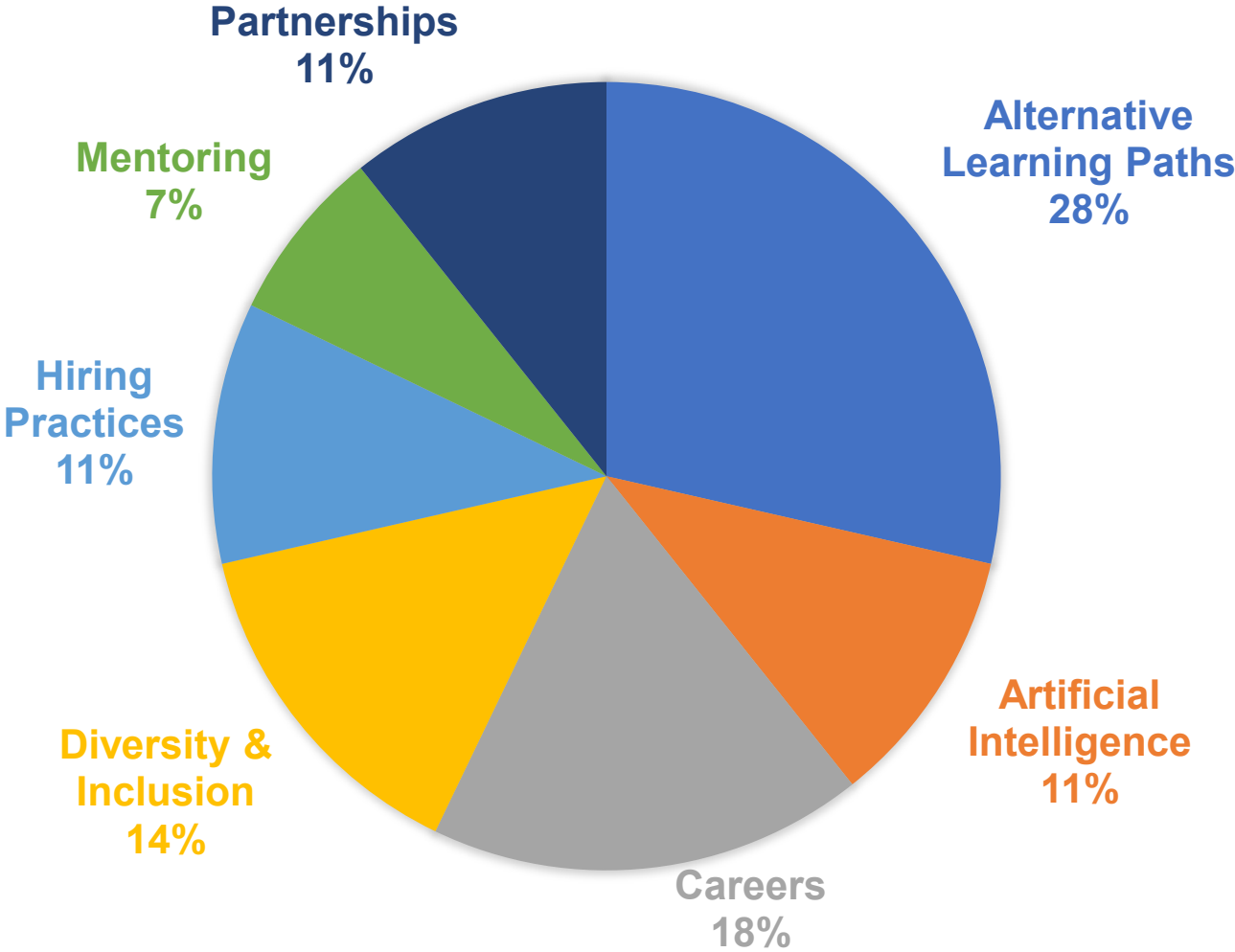
CONVERSATION 2 – CONTRIBUTIONS
LIST OF CATEGORIES

The ideas expressed by the participants during Conversation 2 were grouped under these categories:

Categories	Conversation 2
Alternative Learning Paths	8
Artificial Intelligence	3
Careers	5
Diversity & Inclusion	4
Hiring Practices	3
Mentoring	2
Partnerships	3
Total:	**28**

CONVERSATION 2 – CONTRIBUTION CATEGORY DISTRIBUTION

Partnerships 11%
Mentoring 7%
Hiring Practices 11%
Alternative Learning Paths 28%
Artificial Intelligence 11%
Careers 18%
Diversity & Inclusion 14%

CONVERSATION 2 – OVERVIEW

Participants identified numerous ways in which they could contribute to closing the talent gap.

Support alternative learning paths

- Awareness and information campaign on cyber security starting as early as age 6
- Speak at local schools and events to increase awareness, especially at the High School level
- Guest lectures and mini-internships at local universities
- Adapt curriculum to fast changing needs
- Become a mentor

Facilitate career entry

- Provide a clearer vision of what a career in cybersecurity will look like to students and young professionals, define a pathway
- Create internship programs in collaboration with cybersecurity and AI vendors and local universities to help the channel gain talent
- Advocate with employers to invest in training their talent internally (less costly)
- Support career transitions, re-skilling
- Create a concept for Cyber Auxiliary

Diversity and Inclusion
- Develop programs for under-served communities
- Advocate for more women in the Cyber Security and Artificial Intelligence fields
- Support diversity and inclusion

Partnerships
- Create a joint industry and government task force to pool resources for cyber defense
- Get involved in NIST NICE work group
- A future type of partnership is required - the partnership and symbiosis of man and machine

Make careers attractive
- Gamify; Companies could create hack games and competitions to identify talent
- Glamorizing the field of cyber security and AI for young people should be a priority through the creating of new TV series

Artificial Intelligence
- Automate routine tasks with AI an RPA
- Extend the scope and ability of humans through AI and RPA to become more effective and hence reduce the gap

Personal engagement
- Take part in online community opportunities
- Commit to a discipline in cyber security periodically

TOWN HALLS
KEY POINTS MADE BY PARTICIPANTS

Michael Thiessmeier noted that it's easy to forget about the SMB sector, as well as non-critical infrastructure. However, there is a need for a nationwide concept to address Cyber Civil Defense. He cited the example of some states that have created a Cyber Auxiliary, which essentially allows the pulling of resources.

MK Palmore noted that the issues are so big, it is hard to move the needle. Government needs to be involved because they are the ones who can drive the change. Alignment with private sector becomes eminently important.

Mike Lloyd highlighted the need to create new professional profiles. We have gurus and scientists, but we need the equivalent of a dental hygienist so that HR can lower the bar when hiring. It is time to define these new qualifications.

Jennifer Gold reiterated the importance of public-private partnerships.

Claudio Lanza stressed that the education and business sectors need to prompt the emergence of new learning experiences, including soft skills, gamification and shorter courses.

Gilles Esposito noted that there was agreement in the groups on the influence of government and academia. Methodologies and approaches to solve problems where defined. Addressing diversity emerged as an important issue, as well as the need to focus on soft skills as well as technical skills.

Jill Wideman supported the importance of teaching soft skills because there is an entire generation that is more comfortable talking in text messages versus face to face.

Tony Zirnoon stressed that talent is not only a matter of certificates, but also of having a hacker's mindset so it's important to identify talent early and to train early. Update educational programs need to adapt to industry needs and reinforce the Cyber Security Practitioner role. He noted that the urgency of establishing partnerships, engaging with policy makers and introducing them to the solutions offered by cyber security and AI.
He proposed the creation of an "**America's got Cyber Talent**" platform to raise awareness and attract talent.

CONVERSATION 3 - PARTNERSHIPS

In Conversation 3, participants connected around a shared area of interest to explore new partnerships or strengthen existing ones. They assembled into the break-out room of their choice around the following themes:

- Academic Programs and other Learning Paths
- Improving Hiring Practices
- The Role of Technology

They were invited to explore the following question:

Question 3:

What opportunities for partnership do you see emerging from this meeting?
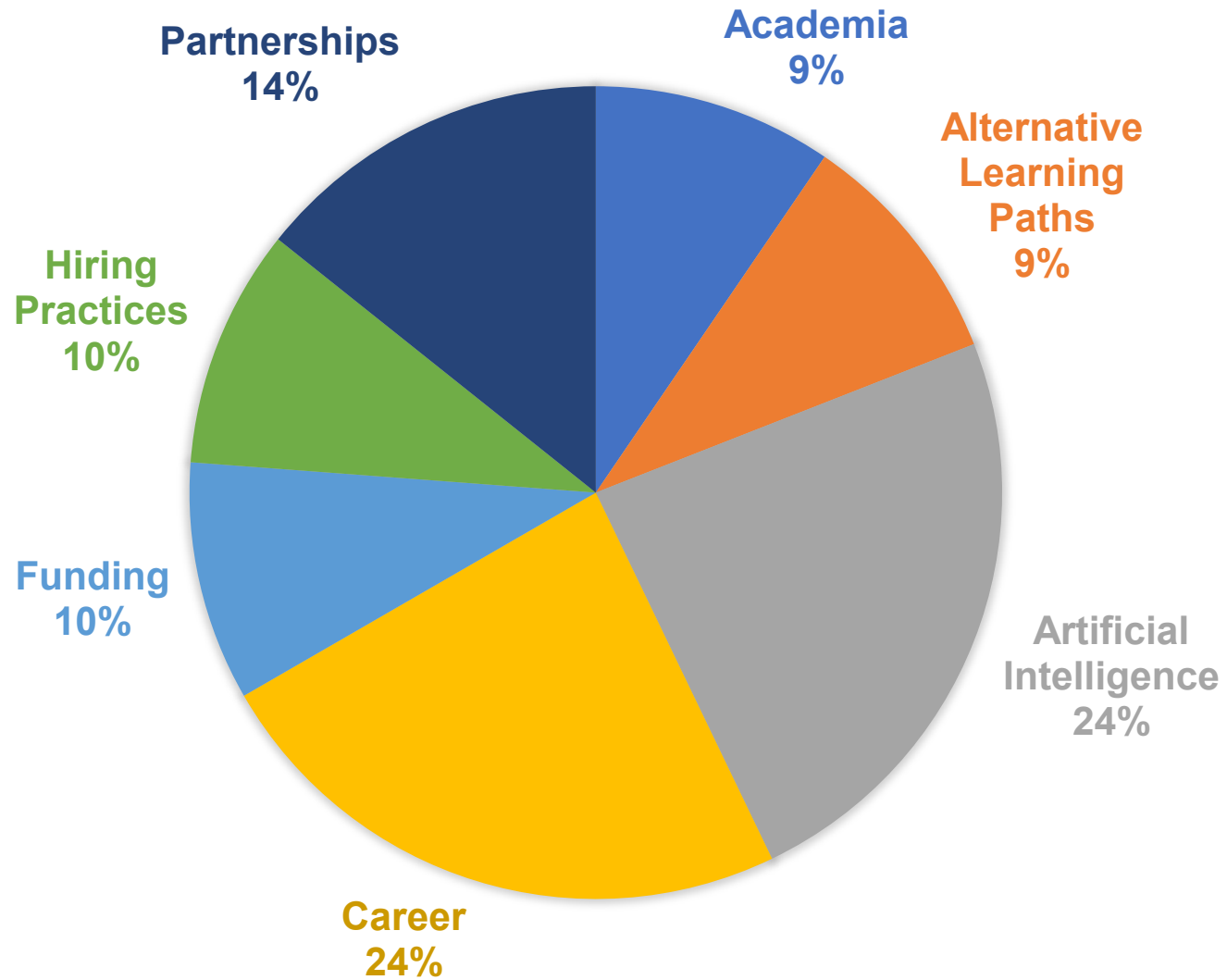
CONVERSATION 3 - PARTNERSHIPS
LIST OF CATEGORIES

The ideas expressed by the participants during Conversation 3 were grouped under these categories:

Categories	Conversation 3
Academia	2
Alternative Learning Paths	2
Artificial Intelligence	5
Career	5
Funding	2
Hiring Practices	2
Partnerships	3
Standards	4
Total:	**25**

CONVERSATION 3 – PARTNERSHIPS CATEGORY DISTRIBUTION

Very concrete outcomes came out of the discussion and partnerships were already being built

Academia and industry to:

- Create career and certification paths, optimize curricula and provide gamified courses
- Host space for employers to meet graduates

Artificial Intelligence can be used in various ways help close the talent gap

- AI for the automation of routine tasks
- AI platforms can augment the tier 1 analysts to perform at tier 3 and 4
- AI is a potential solution for the enablement of SMBs
- Support SMBs by teaching basic cybersecurity and a combination of AI toolsets for automated detection and monitoring
- Some of the gap maybe addressed by creating AI technology to support entry level people to manage more complex tasks
- AI can also be part of the solution. Opportunity to use technology to improve the industry hiring processes, in particular as a way to allow for more diversity inclusion

Areas for continued investigation

- How AI can help us improve Cybersecurity?
- Will the AI and Cybersecurity Skills shortage help or maybe hurt the industry?

Drive for alternative learning paths

- Enable colleges to offer Cyber Ranges for Cybersecurity Programs and apprenticeships
- Adjust the education model to meet the need of the cybersecurity field starting as soon as elementary school all the way until adult education
- Mentorship at all levels, for college students, young graduates and those starting a cybersecurity career to learn valuable skills

Improve talent sourcing and hiring practices
- Help employers grow their own talent, provide personal and professional support to be successful, and most important foster diversity
- Job listing requirements are a big barrier, create easier entry paths

Use the sales channel to help close the gap
- Inject talent in vendor channel
- Encourage young entrepreneurs to add to the channel with trained talent
- Build a vendor, academia and skilful talent sourcing path
- Form partnerships between large industry giants like Cisco/ Google/ AWS and leverage their channel

Participants also addressed the need to partner for funding

- Cybersecurity needs its own "moonshot." Maybe we have an administration ready to pay attention

- Collaboration with the government for funding to support private sector/public education scholarships

Creation and strengthening of partnerships

- Harmonize programs between industry associations, colleges and private sector

- Invite smart start-ups to share their approach and success studies so as to duplicate where possible

- Build partnerships to conduct information operations and enable local organizations/populations to 'protect' themselves

- Partnership with ISSA, ISACA, ISC2, SANS, SINET

- Partnership with ISSA and community colleges

Make careers in cybersecurity and AI attractive

- Help build **America's Got Cyber Talent** platform, bring mentors and judges from the industry

CLOSING REMARKS
Gilles Esposito, Board Director

Key points from Gilles Esposito's Closing Remarks

- The topic of education has been center stage, with discussions around the need to update curricula with alternative learning paths such as green belt to black belt process improvements and specific technical certifications.

- It is important to create interest at an earlier age through gamification and to make cyber security attractive.

- The concept of **America's got Cyber Talent** is a great idea, as is the idea of doing more hackathon and things of that nature.

- It is just as important to fill the talent gap as it is to reduce it.

- The need for so many talents is increasing and injecting AI in the solution will reduce the need for a talent pool.

- Lastly partnerships are essential to address the human talent gap, so we must explain and underscore the relevance of what we're trying to do when approaching for profit partners.

> " *Thank you! I just want to say thank you for everybody, because everybody was extremely supportive and very courteous and respectful of others, so this was a great event, thank you.* "

NEXT STEPS

Carlo Tortora Brayda thanked the participants for their active engagement in the discussions, and for the rich outcome of the event. He encouraged them to continue engaging in the multi-stakeholder dialogue, and to explore partnerships to help mitigate the risks arising from the human talent gap in cyber security and artificial intelligence.

Whenever you bring about people with different views, expertise and perspectives, you end up achieving things that you couldn't do individually, because no one person has the entire picture.

Our mission is to push the boundaries of progress, and its ethical accomplishment through successful multi-stakeholder partnerships.

- Tortora Brayda Partnership Excellence

How did you like the World Café meeting?

I liked it very much: **94%**

It was ok: **6%**

I didn't like it: **0%**

Would you recommend using it again?

Yes: **100%**

No: **0%**

ORGANIZING TEAM

For Tortora Brayda Partnership Excellence

Carlo Tortora Brayda di Belvedere, Founder and Chairman

Gilles Esposito, Board Director

Jill Wideman, Chief of Staff

Miguel Garibay, Executive Administrator

Susanne Runald, Media Relations Director

Gerry Ponce, Administration

For Leaders Today

Saba Imru-Mathieu, CEO, Senior Executive Coach, World Café Host

Dana L. Walden, Senior Coach, World Café Co-Host

Sabrina Fares, Senior Consultant & Coach

Sara Heppner, Founder of Saragrafix, World Café Graphic Recorder

The Human Talent Gap In Cyber Security And Artificial Intelligence

Participant List

January 26, 2021

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Thank you

TORTORA BRAYDA