



# Navigating the Future of Flight:

**AI & Psychometrics in Pilot Selection & Recruitment: A Collaborative Model for Sustaining Quality Pilot Supply.**

# The APC Ecosystem

*Connecting Airlines, ATOs, and Members*

The APC Ecosystem is a network that unites airlines, flight training organisations, and graduate pilots with a shared vision of advancing aviation careers.



## APC Members

20,000+	Freemium Members
4,800	Pilots in Training
4,100	Qualified Pilots

## Airline Partners



APC's commitment is to foster a robust network that:

- Facilitates the professional growth of pilots
- Bridges the gap between their training and airline employment
- Rewards high-quality ATOs
- Delivers safe & efficient pilots to airlines



## Aleksandra Kapela

- Aviation Psychologist
- MSc in Occupational Psychology
- Human Factors Specialist
- Ground School Instructor
- Works with individuals, flight schools, airlines, operators
- Pilot suitability, personality, well-being, mental health

## Symbiotics Limited

- Over 25 years' experience of providing assessment and selection
- Training and consultancy services in over 130 locations
- Spread through 80 countries, across 5 continents
- Specialised in the aviation industry



# Recruitment & Training Challenges in Aviation

The Complexity of  
Aviation Roles

Regulatory and Safety  
Considerations

Rapid Technological  
Advancements

The Global  
Talent Pool

High  
Training Costs

## Solutions:

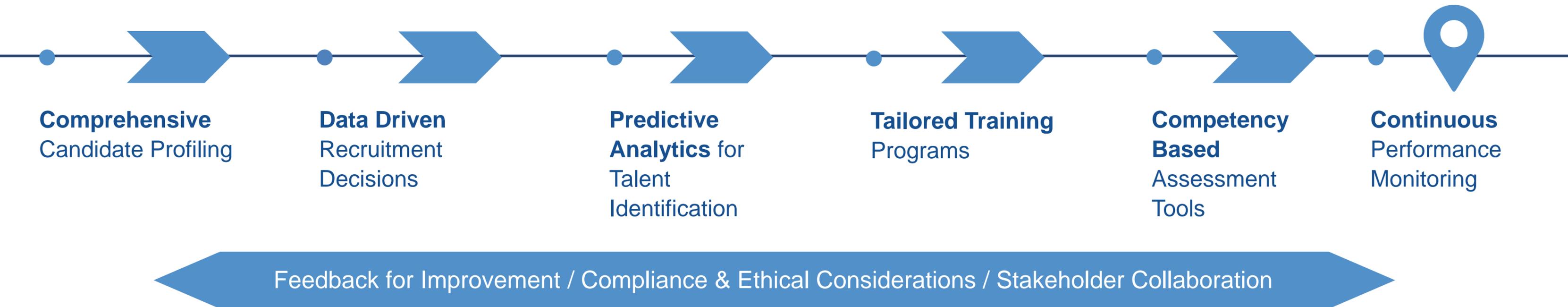
- Focus on personalised, evidence-based training, supported by advancements in AI and data analytics
- Leveraging data, technology, and new methodologies to identify, select, and train individuals

# Data Driven Recruitment and Training Platform



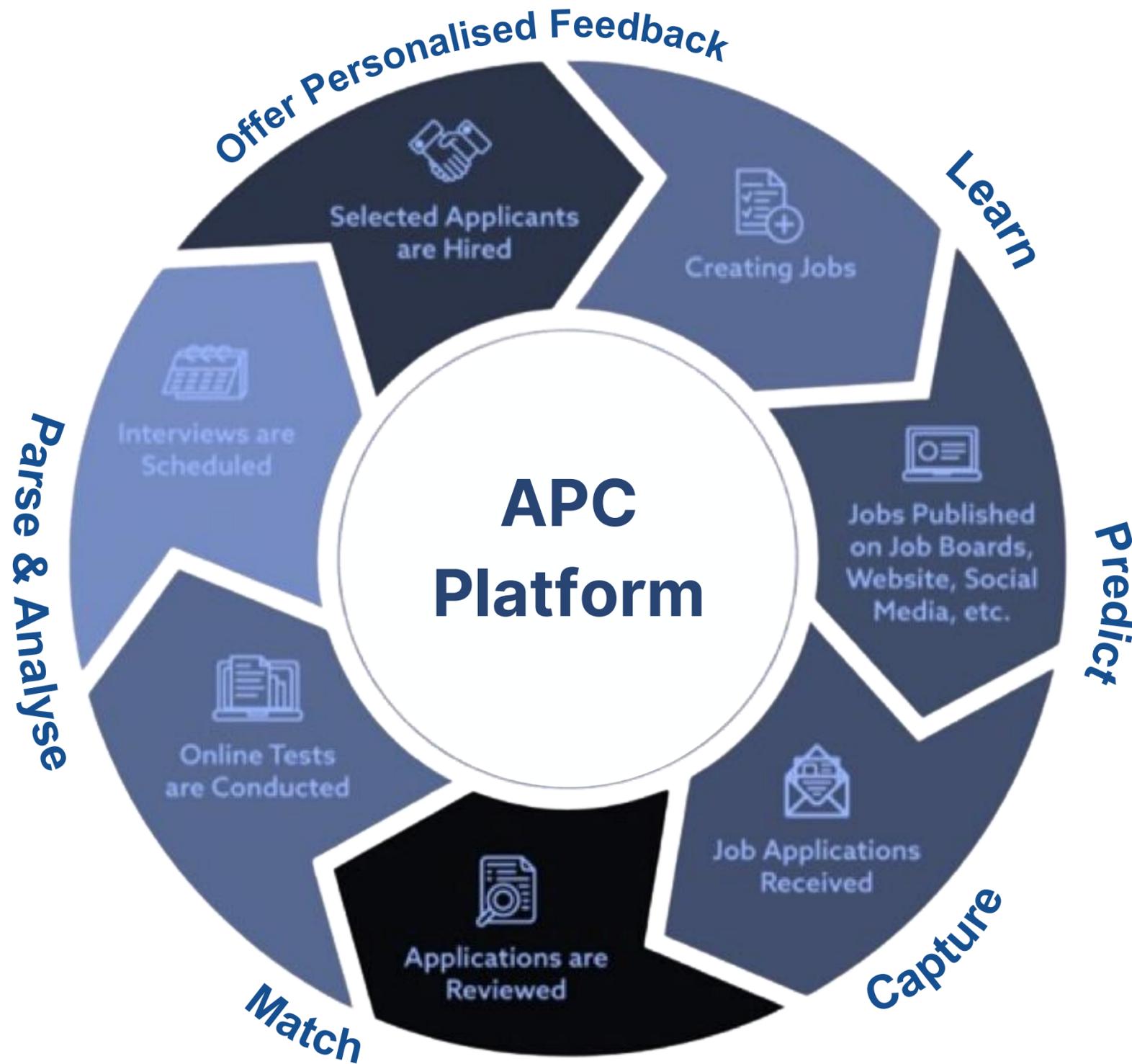
# Data Driven Recruitment Process

## Technology Platform (Roadmap & Integration)



# Applicant Training System

**2023**  
1,500,000  
Applications



Symbiotics Optimum Avianca Pilot Profile



**1,776**  
Candidates

Filtered by APC Platform, based on Avianca Requirements



- Letter informing selected applicants included in next step

**750+**  
Candidates

Online Interview & English Language Assessment



- Letters informing applicants of available slots for interview
- Conducted by experienced airline pilots and training captains
- Administered through platform
- **3 data points recorded in platform**

**620**  
Candidates

Symbiotics digital optimum profile Psychometric Assessment & Knowledge Test



- Cognitive - assessing mental processes of perception, memory, and reasoning
- FAST - A multitasking, workload management test
- APQ - A Personality questionnaire
- Focused on "Avianca Optimum Digital Pilot Profile"
- **35 data points recorded in platform**

**553**  
Candidates

**180**  
Recommended for A320 TR

Competency based simulator assessment - King Air 200/350 in Bogotá

- Conducted by APC SMEs
- **11 data points recorded in platform**

**360**  
Candidates



**180**  
Candidates Selected

**49 Data Points Analysed with AI**



**SYMBIOTICS**

# Symbiotics Profiling Process

Combining Proven & Innovative  
Technical Solutions

# WHAT IS PROFILING?

High-standard research process to understand the company's culture and requirements for aircrew in the future.

Involves creating and analysing: Job Description, Organisational Culture, Skills and Attributes of the role, training syllabus and challenges against the backdrop of the national educational standards and culture of the airline and its requirements.

The information analysed and mapped against the 64 ADAPT behavioural profiles along with any key competencies, attributes, attitudes and skills that will inform the selection process.



# PROFILING DNA

- Personality
- Competencies
- Attitudes
- Abilities
- Motivation
- Expectations
- Culture



- Attributes valued by airline
- Attributes not tolerated by airline
- Organisational Culture
- Assessment Criteria
- Training Culture
- Desirable Behaviours
- Regional cultural, educational & economical aspects

# PROFILING ELEMENTS



Issuing Questionnaires and Questions



Carrying out interviews/focus group sessions



Analysing questionnaire responses and data from interviews



Researching the regional culture, educational standards, and lifestyle



Analysis of the results and production of an Organisational profile and the preferred Role Attitude



The delivery of a Profile Report



Altering algorithms in the PQ report generation to map scores to the agreed profile

# RECRUITMENT SUCCESS

Profiling ensures that the right people are identified who will not only complete training but also:

- ✓ Be more efficient and contribute to the safety
- ✓ Be a good employee, who provides sufficient length of service to maximise Return on Investment
- ✓ Thrive in the company culture and enable change

**MORE SATISFIED BEING IN THE COMPANY**

=

**MORE EFFICIENT, WILL STAY LONGER**



# Avianca Symbiotics Profile



**TC4a**

**TP4a**

**TC2a**

**IC4a**

**TC4b**

**TC4d**

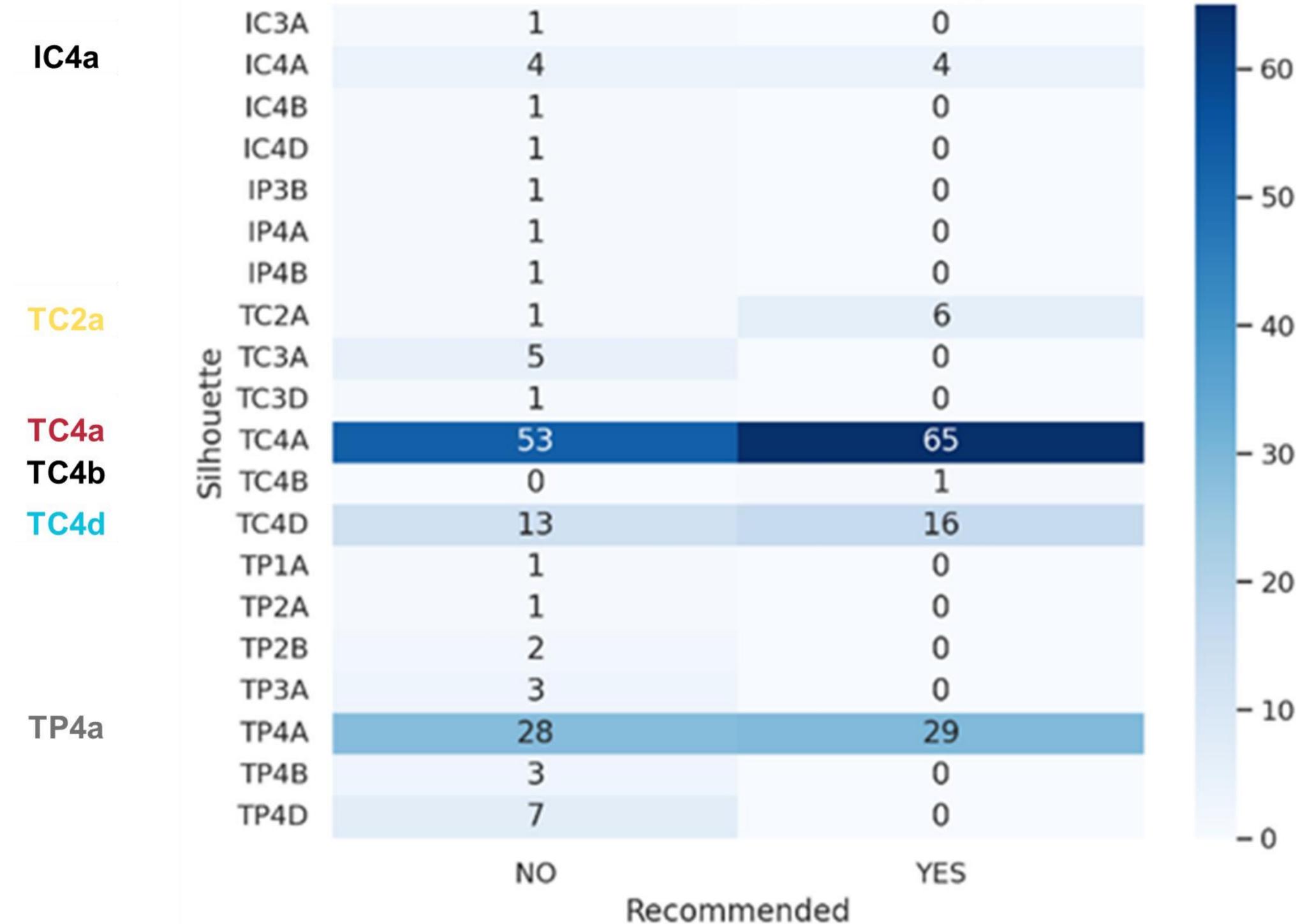
- Analytical Prowess
- Structured Problem-Solving
- Thoughtful Team Collaboration
- Safety-Conscious
- Practical Skill Development
- Resilient
- Effective Communication
- Professional Dedication
- Adaptability
- Excellence in Execution

# Avianca Symbiotics Profile (Selection)



## SYMBIOTICS

Recommendation by Silhouette Type



# Avianca Symbiotics Profile Consequences



Ideal pilots combine analytical thinking, structured problem-solving, and collaborative teamwork



They apply a high level of responsibility and focus on safety, with natural analytical skills



The development of practical skills may enquire patience and occurs best in structured learning environments



Training should enhance practical skills, resilience, and communication to ensure pilots perform well under pressure and in teams, with a consistent emphasis on safety



# Psychometric Assessment & Simulation Evaluation Prediction

# Symbiotics Optimum Digital Pilot Profile

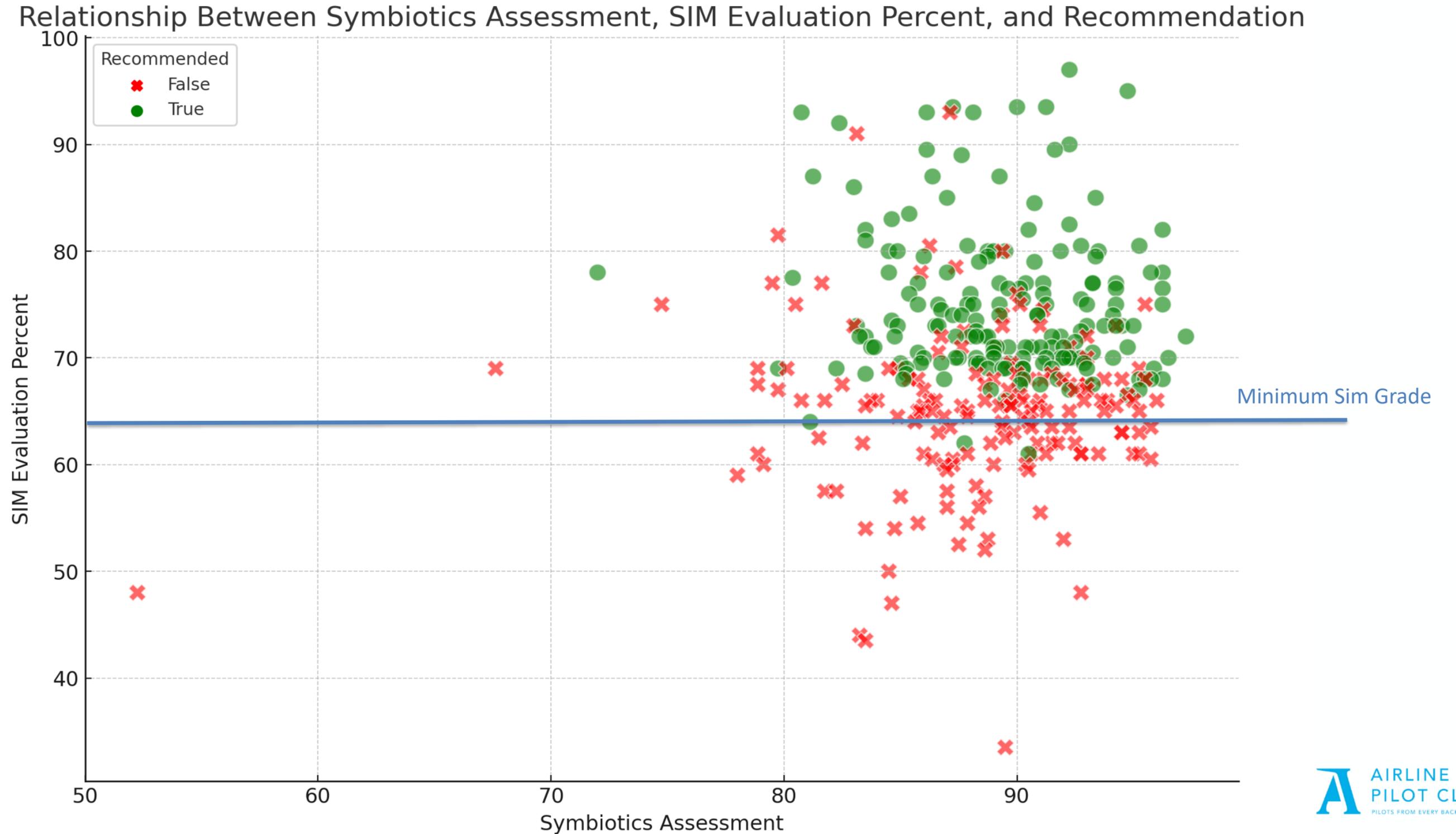
## Top Candidates

## Bottom Candidates

Candidate details:			Personality							Academic							Cognitive							FAST					
Number	License Code	Assessment Date	Overall	Silhouette	Safety Culture	Personal	Character	Cultural Fit	Cognitive (%)	Column1	Numerical (%)	Column2	Verbal (%)	Column3	SRR (%)	Column4	PSA (%)	Column5	WM (%)	Column6	Abstract (%)	Column7	Overall	Overall Value (Out of 20)	Physical	Cognitive	St. Aware.	Learning	Performance
A51485	M78M-FACM-SW7G-BVEP-UXCB	10/14/2023	98	TC4a	98	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	17	15					
A48141	S32N-SBUL-TFCT-MHJG-9V7C	9/22/2023	100	TC4a	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	17	15					
A49652	TKMX-HNK6-XLEX-VE4J-AW9A	9/20/2023	97	TC4a	97	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	18	19					
A47312	54SL-NHPC-VY39-R3C8-WCKK	9/5/2023	97	TP4a	97	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	18	18					
A49398	682P-J5YB-QLR9-HJYH-88WT	9/15/2023	97	TC4a	97	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	18	18					
A51468	HYPF-CDPV-7GQU-TQEA-YF5Q	10/14/2023	97	TP4a	97	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	18	18					
A49519	MZBF-ZFDH-6ZRX-XZMP-EV9F	9/16/2023	97	TC4a	97	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	18	18					
A47839	4IBF-UV48-SP35-X294-DJGM	10/6/2023	97	TC4d	97	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	17	17					
A49458	JYE7-GMRN-B5W8-6H8U-RPUW	9/16/2023	97	TC4a	97	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	17	17					
A49411	MBH6-KRWG-2K43-K7GV-DQNH	9/16/2023	97	TC4a	97	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	17	17					
A53358	RQ8Q-USKL-N9HD-XQ7D-TXXM	11/15/2023	97	TC4d	97	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	17	17					
A49578	UFBV-NDOY-65Z6-J6HQ-LBBW	10/1/2023	97	TC4a	97	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	17	17					
A48610	YLO8-8PS3-LDMC-48VJ-MDYL	10/9/2023	97	TP4a	97	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	17	17					
A50112	76NJ-VSEM-PNWN-8JGM-7FXE	9/30/2023	97	TP3a	97	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	16	16					
A51613	8MVK-N8TE-VLUP-VBCY-3AB9	10/18/2023	97	TC4a	97	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	16	16					
A40460	AD2F-AW9D-57Z2-BY6N-LC4F	10/2/2023	97	TP4a	97	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	16	16					
A50601	M7VZ-82LC-UJHJ-QX5Q-3VJD	10/5/2023	97	TP4d	97	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	16	16					
A50155	MZBE-GF5Q-FBYA-CJBC-WYJF	9/28/2023	97	TC4d	97	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	16	16					
A47843	PL8L-8GEU-2RQG-DFS8-CG4F	9/8/2023	97	TP4a	97	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	16	16					
A47605	ZVMB-JTLM-3Z5M-TMZ2-SP3J	9/15/2023	97	TC4a	97	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	16	16					
A51175	Q9RQ-W26H-64RN-WWUC-8X4X	10/10/2023	97	TC4a	97	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	15	15					
A51626	SERT-AYL3-33Q6-N2QF-77NC	10/18/2023	97	TC4a	97	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	15	15					
A47699	7UP9-8HB2-UH8C-UB9F-ZJZ5	9/28/2023	97	TC4a	97	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	14	14					
A49006	L52U-32DU-M48W-5V9Z-TW5H	9/9/2023	97	TC4a	97	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	14	14					
A51543	ZBVT-2785-LA36-DBCQ-X5EY	10/15/2023	97	TC4d	97	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	14	14					
A40312	ZE6H-HVLP-LZJJ-9YQ9-W955	9/26/2023	97	TP4a	97	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	14	14					
A50048	5TZE-4KWL-K8LD-XNW5-BJ4P	9/26/2023	97	TC4a	97	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	13	13					
A48716	6XVC-6399-TMRQ-X75U-E5J3	9/8/2023	97	TC4a	97	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	13	13					
A40502	AENE-DVXM-WGDE-SFED-KRM4	9/30/2023	96	IP3a	96	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	18	18					
A50149	EA7B-VS4K-UL85-5MSP-SFNR	10/10/2023	96	TC4a	96	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	17	17					
A50953	FEAM-V58K-5S4D-XUKX-73HE	10/7/2023	96	TP4d	96	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	16	16					
A49024	NXNI-D35M-UMFD-36SX-FRGP	9/7/2023	96	TC4a	96	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	16	16					
A51812	UANW-F3ZQ-SGFV-V4PV-JLYC	10/20/2023	96	TC4a	96	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	16	16					
A53252	C9KW-RTSC-VFGJ-3PHK-Z4KS	11/12/2023	96	TP4d	96	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	15	15					
A51690	HS4D-4BXR-JCKA-398H-QNY5	10/17/2023	96	TP4d	96	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	15	15					
A50403	DV5F-ECJ6-C2CU-6IN3-2YRL	10/3/2023	95	TC4a	95	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	18	18					
A52699	HMDH-X229-G4A5-PGXQ-LBTV	11/1/2023	96	TP4a	96	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	14	14					
A50924	E2XN-XXNK-4TZA-BNCP-R2UD	10/9/2023	96	TC4d	96	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	13	13					
A56326	H3KR-FBR4-KBZT-EC2X-L9UA	1/31/2024	95	TP4a	95	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	17	17					
A50653	3QY5-HUAQ-TCZW-TTDF-QPX3	10/5/2023	95	TP4a	95	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	16	16					
A49668	6T7T-4G2H-6347-8WET-JHH5	9/20/2023	95	TC4d	95	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	16	16					
A50782	Y6F2-LMLW-VVEK-S8WN-LYPD	10/6/2023	95	TP4a	95	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	16	16					
A47714	C2MY-AJEZ-W6GH-XL75-DHGJ	10/21/2023	95	TP3a	95	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	17	17					
A47644	GQFK-JWQH-K7V5-5K5G-MG97	10/2/2023	95	TC1d	95	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	15	15					

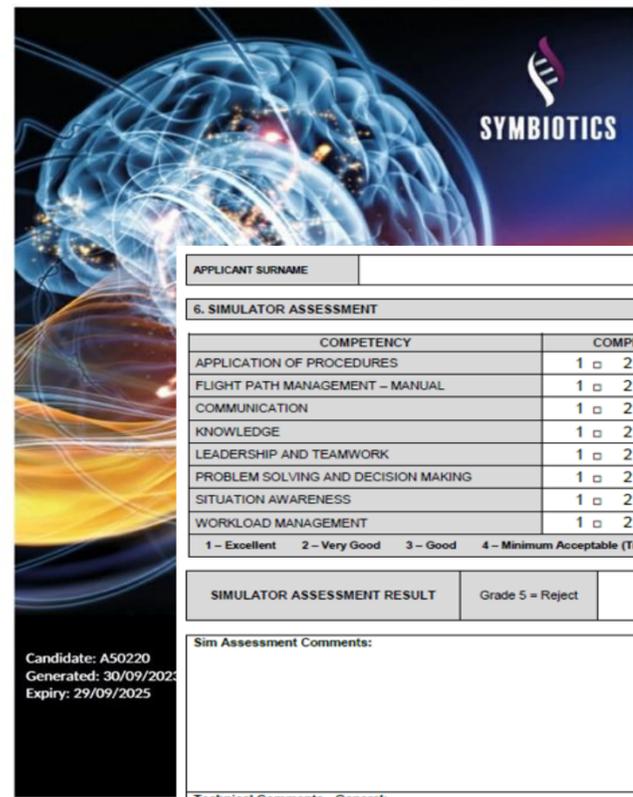
Candidate details:			Personality							Academic							Cognitive							FAST					
Number	License Code	Assessment Date	Overall	Silhouette	Safety Culture	Personal	Character	Cultural Fit	Cognitive (%)	Column1	Numerical (%)	Column2	Verbal (%)	Column3	SRR (%)	Column4	PSA (%)	Column5	WM (%)	Column6	Abstract (%)	Column7	Overall	Overall Value (Out of 20)	Physical	Cognitive	St. Aware.	Learning	Performance
A50037	C4DG-DGVK-SHEG-BUGU-8W3G	9/26/2023	70	TC4c	70	67	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	100	11	11					
A50862	CRCJ-XSMX-D8N7-NWCE-JV4F	10/6/2023	76	TC4a	76	83	83	67	65	100	100	100	100	100	100	100	100	100	100	100	100	100	8	8					
A51635	8HE9-G59E-SJZ8-NPMG-5JDE	10/18/2023	74	TC4a	74	50	83	83	67	83	77	83	67	83	67	83	67	83	67	83	67	83	14	14					
A48761	JFQK-8X2F-AKJ8-UXIA-WWJQ	9/6/2023	74	IC4d	74	83	67	83	64	67	83	67																	

# Relationship between Symbiotics & Simulator Eval Results

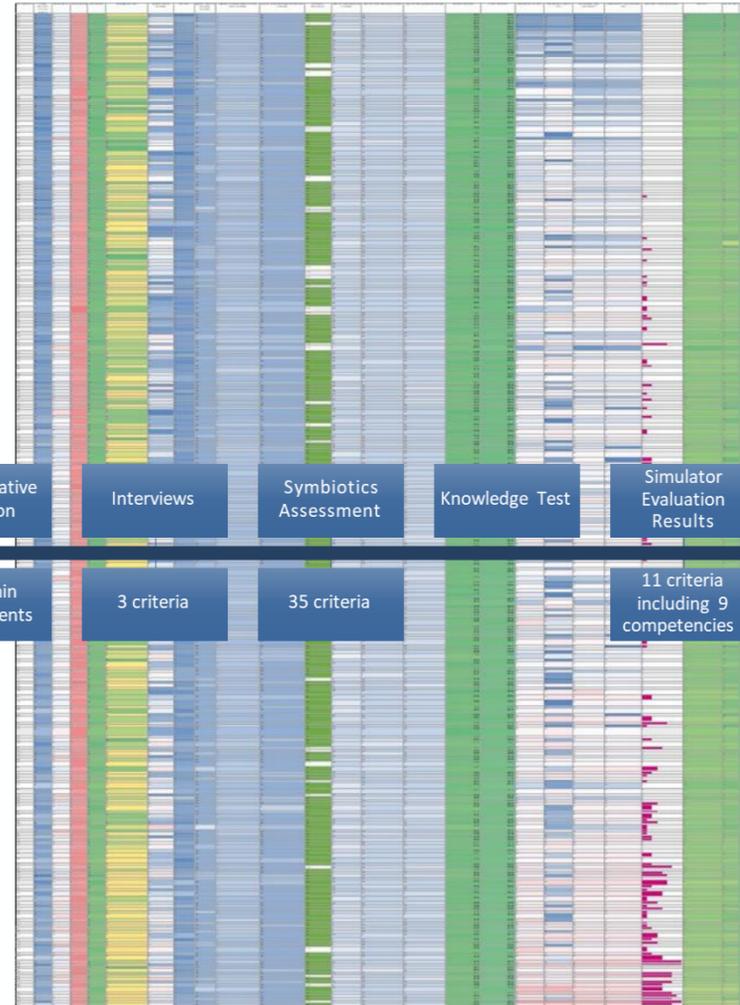


# AI Analysis of Psychometric Assessment & Simulation Evaluation Prediction

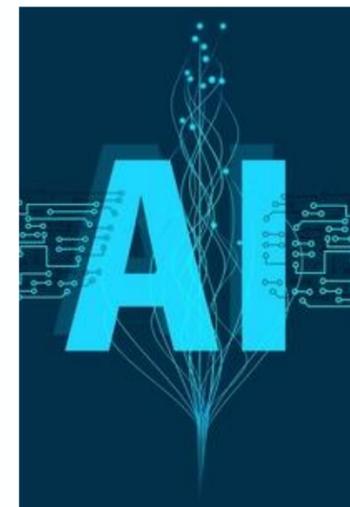
# APC AI EBT/PEBT Optimisation Suite



APPLICANT SURNAME	INITIALS		
<b>6. SIMULATOR ASSESSMENT</b>			
<b>COMPETENCY</b>	<b>COMPETENCY ASSESSMENT</b>		
APPLICATION OF PROCEDURES	1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/>		
FLIGHT PATH MANAGEMENT – MANUAL	1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/>		
COMMUNICATION	1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/>		
KNOWLEDGE	1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/>		
LEADERSHIP AND TEAMWORK	1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/>		
PROBLEM SOLVING AND DECISION MAKING	1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/>		
SITUATION AWARENESS	1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/>		
WORKLOAD MANAGEMENT	1 <input type="checkbox"/> 2 <input type="checkbox"/> 3 <input type="checkbox"/> 4 <input type="checkbox"/> 5 <input type="checkbox"/>		
1 – Excellent 2 – Very Good 3 – Good 4 – Minimum Acceptable (Trainable) 5 – Not Acceptable			
SIMULATOR ASSESSMENT RESULT	Grade 5 = Reject / 40 PASS <input type="checkbox"/> FAIL <input type="checkbox"/>		
Sim Assessment Comments:			
Technical Comments - General:			
<b>7. ENGLISH PROFICIENCY – ICAO LEVEL 4 REQUIRED</b>			
English Proficiency	ICAO Level	Spoken English, Comprehension & Written proficiency at Operator level	PASS/FAIL
Technical		Comments:	
Plain spoken English		Comments:	



Administrative Selection: 15 Admin requirements  
 Interviews: 3 criteria  
 Symbiotics Assessment: 35 criteria  
 Knowledge Test  
 Simulator Evaluation Results: 11 criteria including 9 competencies

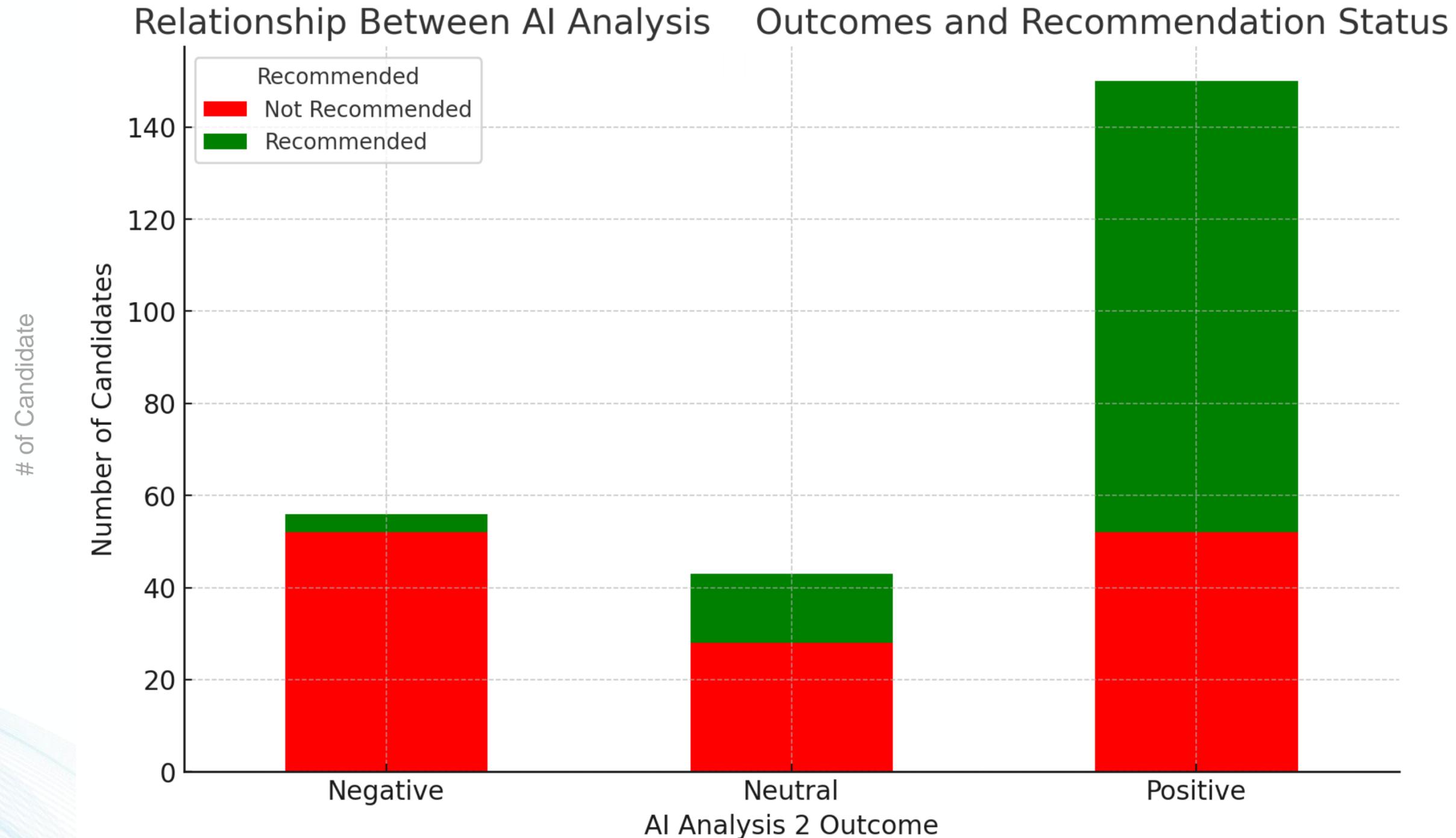


## AI Analysis Includes:

- Sentiments: + / - or Neutral
- Strength/Weakness
- Areas of Improvements
- Overall Evaluation

# APC AI EBT/PEBT Optimization Suite

## Accuracy of AI Results: Sentiment Analysis

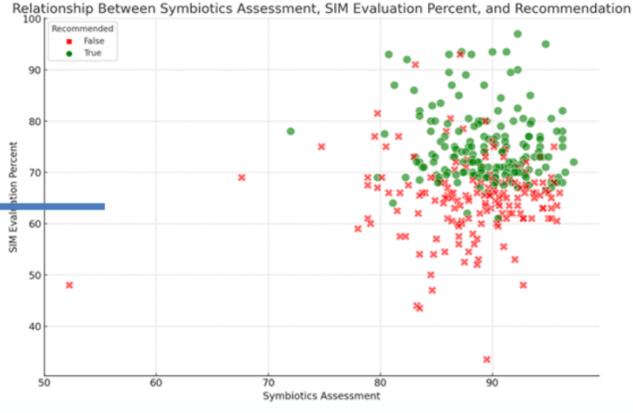


# APC EBT/PEBT Optimization Suite

Application: Candidates Challenges

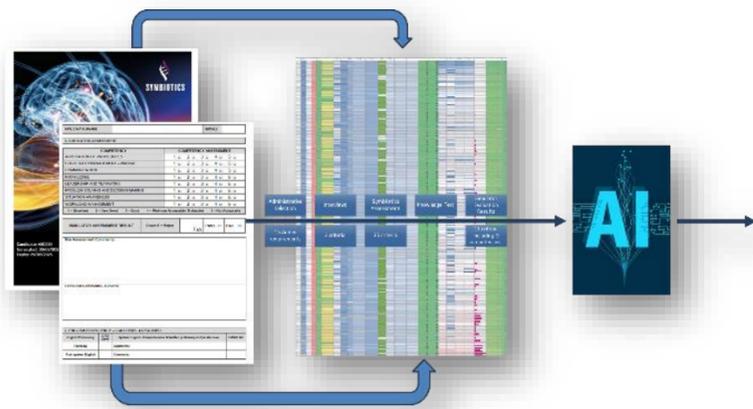


Competency			
PDM, 88	SAW, 73		KNO, 25
	APP, 23		FPM-M, 22
LTW, 87	COM, 62	WLM, 55	FPM-A, 12



# APC EBT/PEBT Optimization Suite

## Application: Daniel's Reports



### AI Report

Strength	Weakness
<p><b>Cognitive Abilities:</b> Daniel demonstrates high cognitive abilities, with perfect scores in Numerical, Verbal Reasoning, and Working Memory. His Spatial Reasoning is also outstanding. These skills are crucial for effective problem-solving and decision-making under pressure.</p> <p><b>Learning and Adaptability:</b> He shows a reasonable ability to learn and adapt, which is vital for continuous improvement and dealing with unexpected situations.</p> <p><b>Technical Skills:</b> High performance in technical skills, indicated by his scores in abstract reasoning and spatial reasoning, suggests a strong foundation for understanding complex aviation systems and procedures.</p> <p><b>Teamwork and Leadership:</b> His personality profile suggests that he is capable of working well in a team environment and possesses leadership qualities, including assertiveness and the ability to lead by example.</p>	<p><b>Perceptual Speed &amp; Accuracy:</b> Although he scored perfectly in the score percentage, his overall percentage and reaction time band indicate areas for improvement, which are important for tasks requiring quick and accurate responses.</p> <p><b>Situation Awareness in SIM Evaluation:</b> The SIM evaluation comments indicate a need to improve situational awareness, a critical competency for pilots to monitor and understand the aircraft's environment and operational status.</p> <p><b>Stress and Pressure Management:</b> His performance may degrade under pressure or complex situations, pointing to a need for further development in resilience and coping mechanisms.</p> <p><b>Communication:</b> Non-standard phrases were used in ATC communications, highlighting a need for improvement in aviation-specific communication skills.</p>

NEUTRAL

The evaluated SIM performance showcased both positive and negative aspects. The candidate exhibited good flight set up, briefing and management of the EHSI failure. However, during the visual join, the candidate's focus on selective radial scan led to flying above ground level at 500ft and a considerable distance from the runway. Additionally, usage of non-standard phrases in ATC communication added to the flight workload. The candidate's performance as a Pilot Flying demonstrated good leadership skills and teamwork.

#### Strengths:

- Exceptional in numerical, verbal, and spatial reasoning.
- Demonstrates good adaptability and learning capabilities.
- Strong technical acumen with a solid understanding of complex aviation systems.
- Shows potential in teamwork and possesses leadership traits.

#### Areas for Improvement:

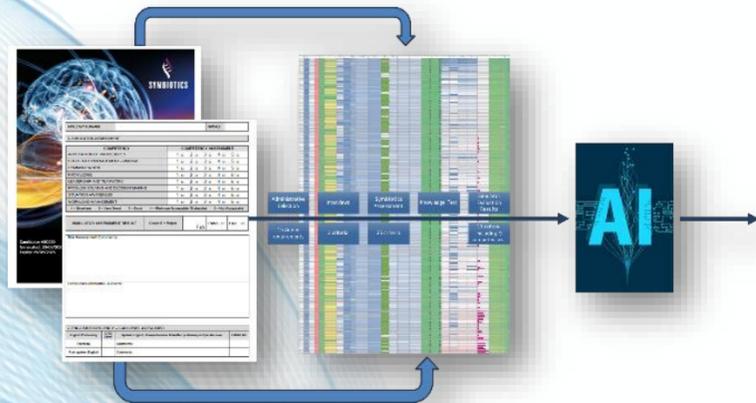
- Improve response times and accuracy in fast-paced scenarios.
- Enhance situational awareness during simulations to better assess environmental and operational factors.
- Develop stronger stress management skills for high-pressure situations.
- Refine aviation communication techniques, ensuring the use of standard phraseology.

#### Overall Evaluation:

- Daniel has shown a balanced mix of technical prowess and leadership potential.
- He needs to focus on specific areas to fine-tune his performance, particularly under stress and in following standard operational protocols.
- Further training should be tailored to address these areas, with a focus on practical applications and communication skills.

# APC EBT/PEBT Optimization Suite

## Application: Daniel's Challenges



### **SITUATIONAL AWARENESS:**

Enhancing His Ability To Maintain Awareness Of The Operational Environment, Especially Under Stress Or When Faced With Unexpected Events.



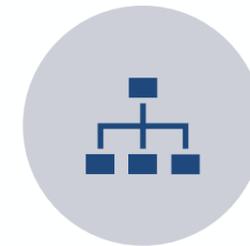
### **DECISION MAKING AND PROBLEM SOLVING:**

Further Developing His Ability To Make Timely And Effective Decisions, Particularly When Information May Be Incomplete Or Rapidly Changing.



### **COMMUNICATION:**

Improving Aviation-specific Communication Skills, Including Standard Phraseology And Clarity In ATC Communications.



### **WORKLOAD MANAGEMENT:**

Developing Strategies To Manage Workload Effectively, Especially In Complex Or High-pressure Situations.

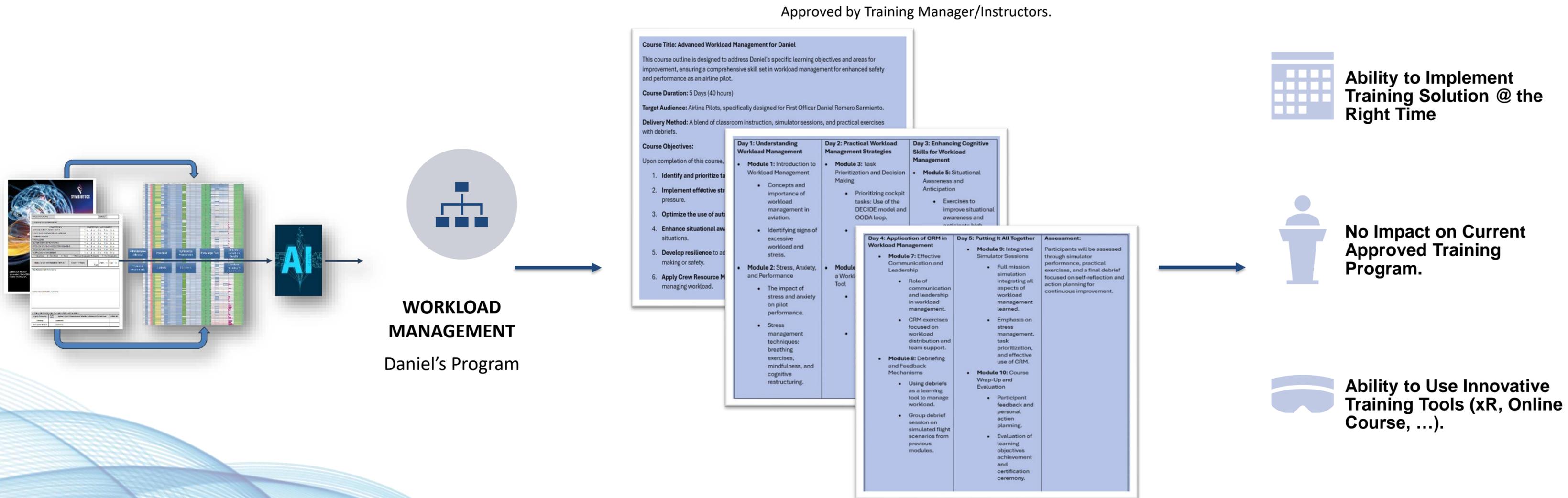


### **TEAMWORK AND LEADERSHIP:**

While Already A Strength, Continuing To Develop These Skills Will Be Beneficial, Focusing On Effective Collaboration And Leadership Within The Cockpit And With Ground Operations.

# APC EBT/PEBT Optimization Suite

## Application: Daniel's Homework Plan to Improve WLM



# The Outcome of the Avianca Pilot Profile

“

Across the entire recruitment campaign, 49 data points were produced and analysed with APC’s applicant tracking platform and AI. A heat map was created which highlighted high-standard candidates at the top and those with competency development issues towards the bottom.

This process clearly identified who should be recommended to the Airline with the likelihood of having a **successful, safe, and efficient career.**

“Client Satisfaction”, pg. 6,

Smart Recruitment: Combing Proven and Technical Solutions Report

**A** AIRLINE  
PILOT CLUB  
PILOTS FROM EVERY BACKGROUND

**SYMBIOTICS**

**Smart Recruitment**

**Combining Proven &**

**Innovative Technical Solutions**



**A** AIRLINE  
PILOT CLUB  
PILOTS FROM EVERY BACKGROUND

# Conclusion

## The Vision behind integrating AI in aviation recruitment and training

- **Enhancing Precision** in Candidate Selection
- **Predictive Analysis** for Future Performance
- **Personalised** and **Adaptive** Training
- **Continuous** Improvement and Learning
- **Meeting** Regulatory and Safety Standards
- **Integrating** a Global Workforce and **Supporting** Inclusivity
- **Sustainability** and **Scalability**

**Thank you!**