

Human-Centered Operations

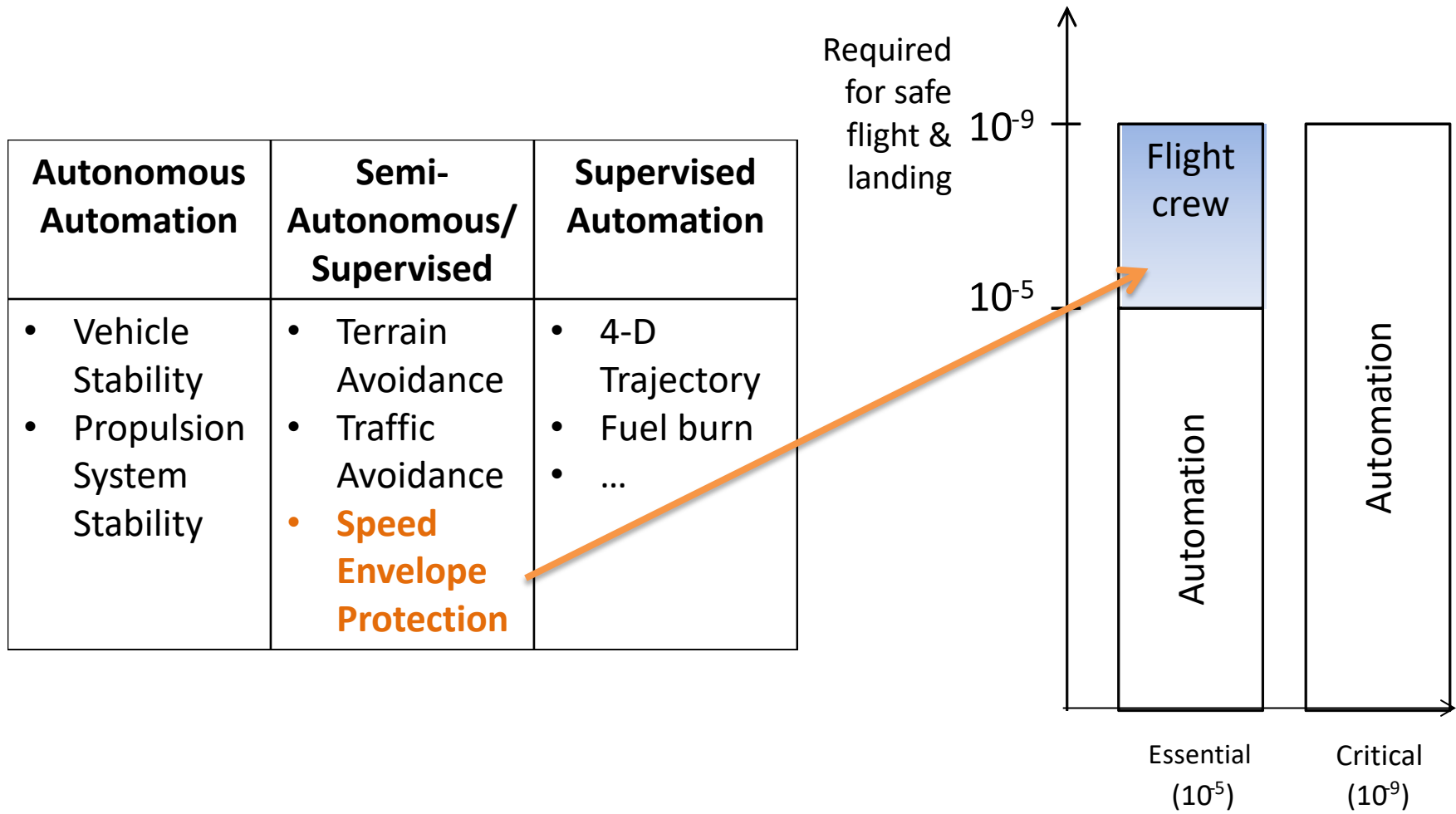
Flight Operations Day
September 19, 2018



Two Key Questions

- What do we expect the human to do?
- What is the human doing now?

The Human Operator is the Barrier to FCF



Flightcrew “mind the gap” between 10^{-9} hazard and 10^{-5} automation

A thought experiment

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- World-wide jet data from 2007-2016 (Boeing, 2016)
 - 244 million departures
 - 388 accidents

A thought experiment

		Outcome	
		Not Accident	Accident
Attributed to Human Intervention	No	?	?
	Yes	20%	80%
		?	388

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			244,000,000

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A thought experiment

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Attributed to Human Intervention	No	195,199,690	78	195,199,768
	Yes	48,799,922	310	48,800,232
		243,999,612	388	244,000,000

When we characterize safety only in terms of errors and failures, we ignore the vast majority of human impacts on the system.

A Little Problem with our Assumptions

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Wrong! 100% of accidents are due to human limitations!

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How do you define “accident”?

Human-Centered?

- It's the humans who make the system work and for humans' sake.
- The system is centered on the human.
- So we better design the system to be human-centered to best support the humans in their work.

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Human-Centered!

But how?

- By understanding the complexity of the operation.

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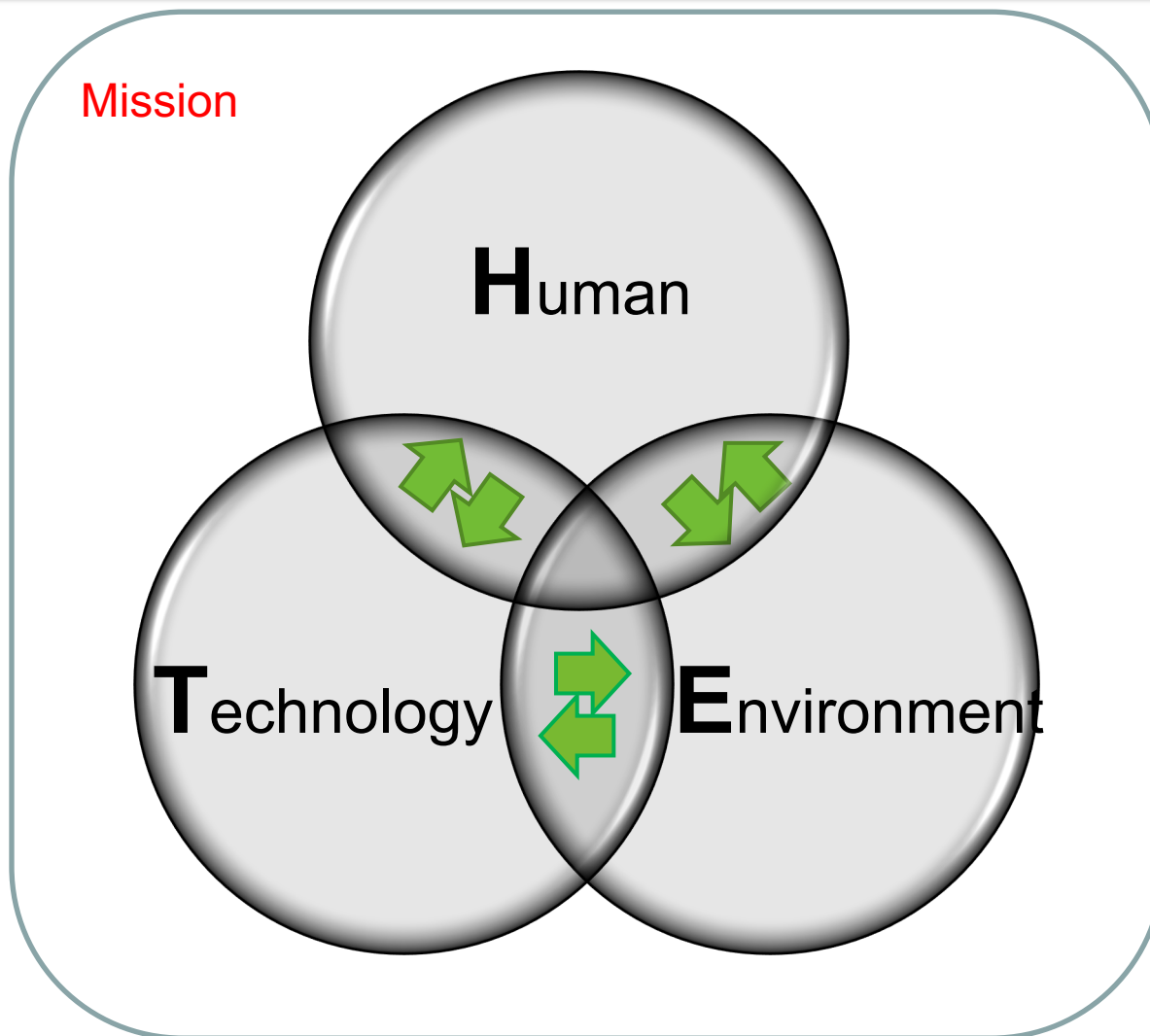
- By understanding the complexity of the operation.
- By creating a clear, coherent, consistent, and comprehensive guidance throughout.

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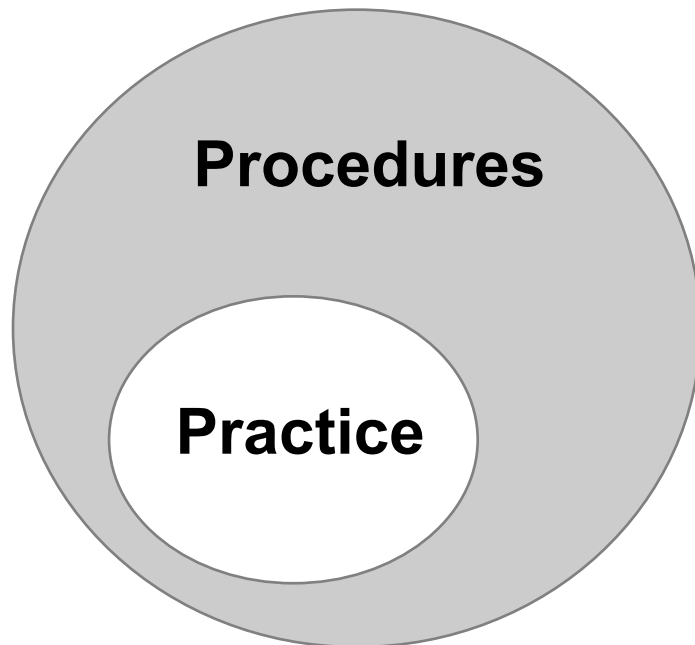
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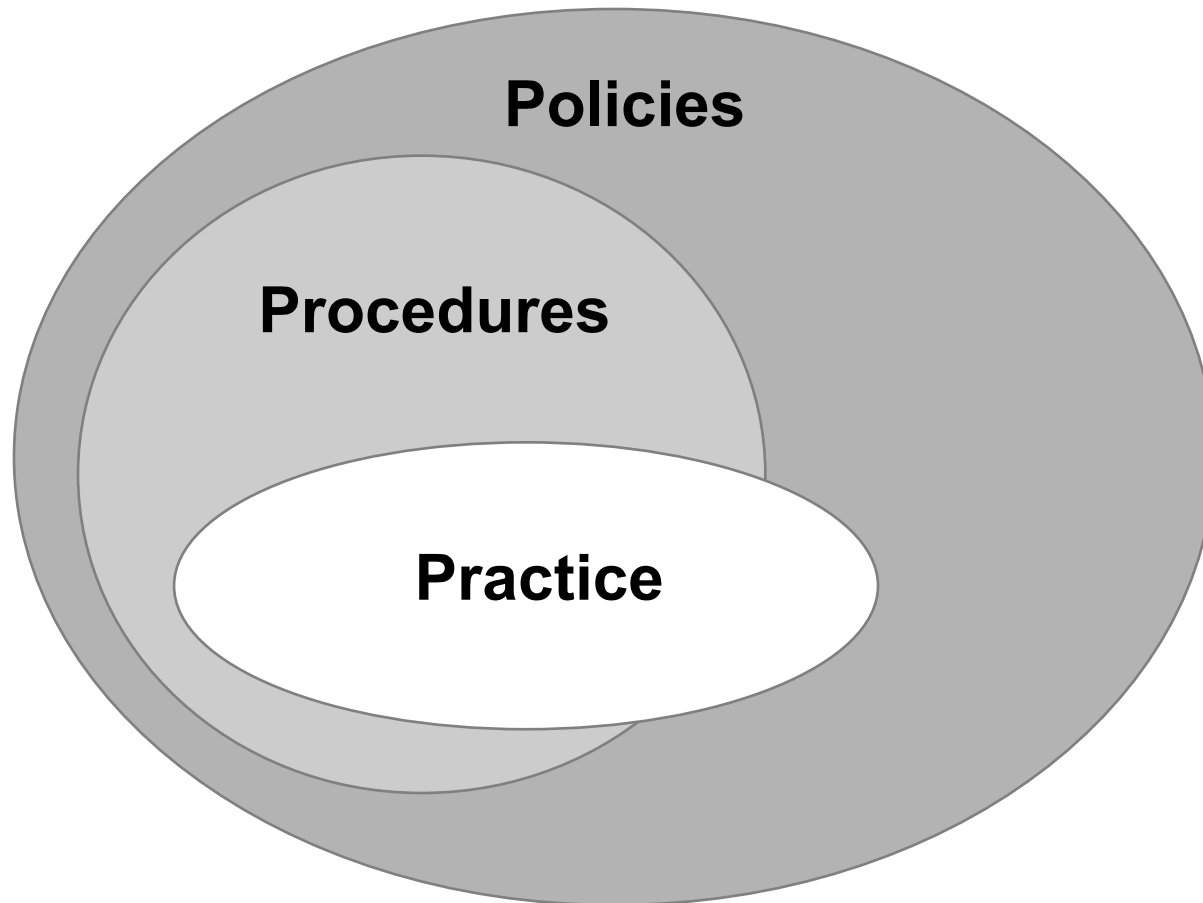
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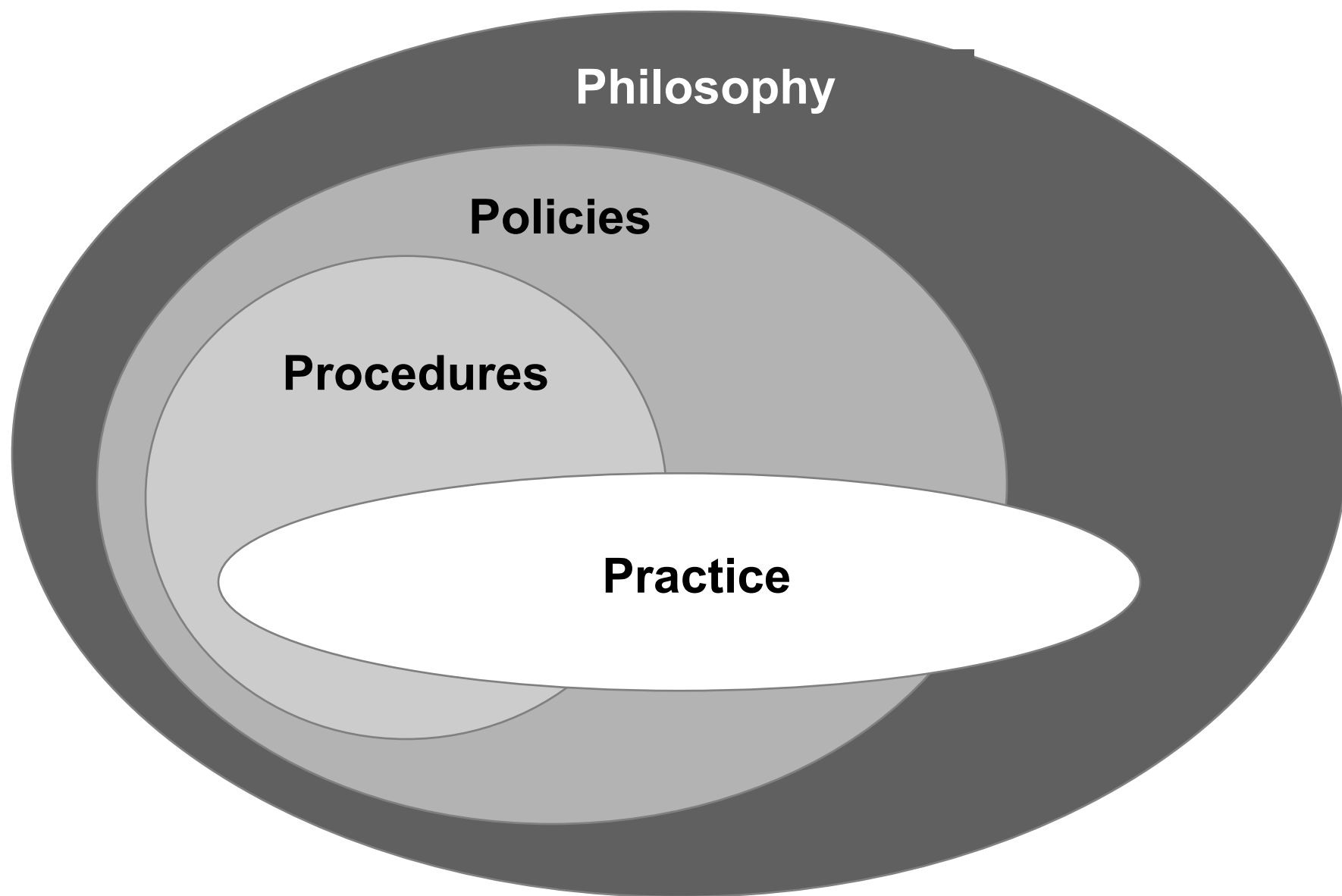
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- THE Model, the 4C's and the 4P's.



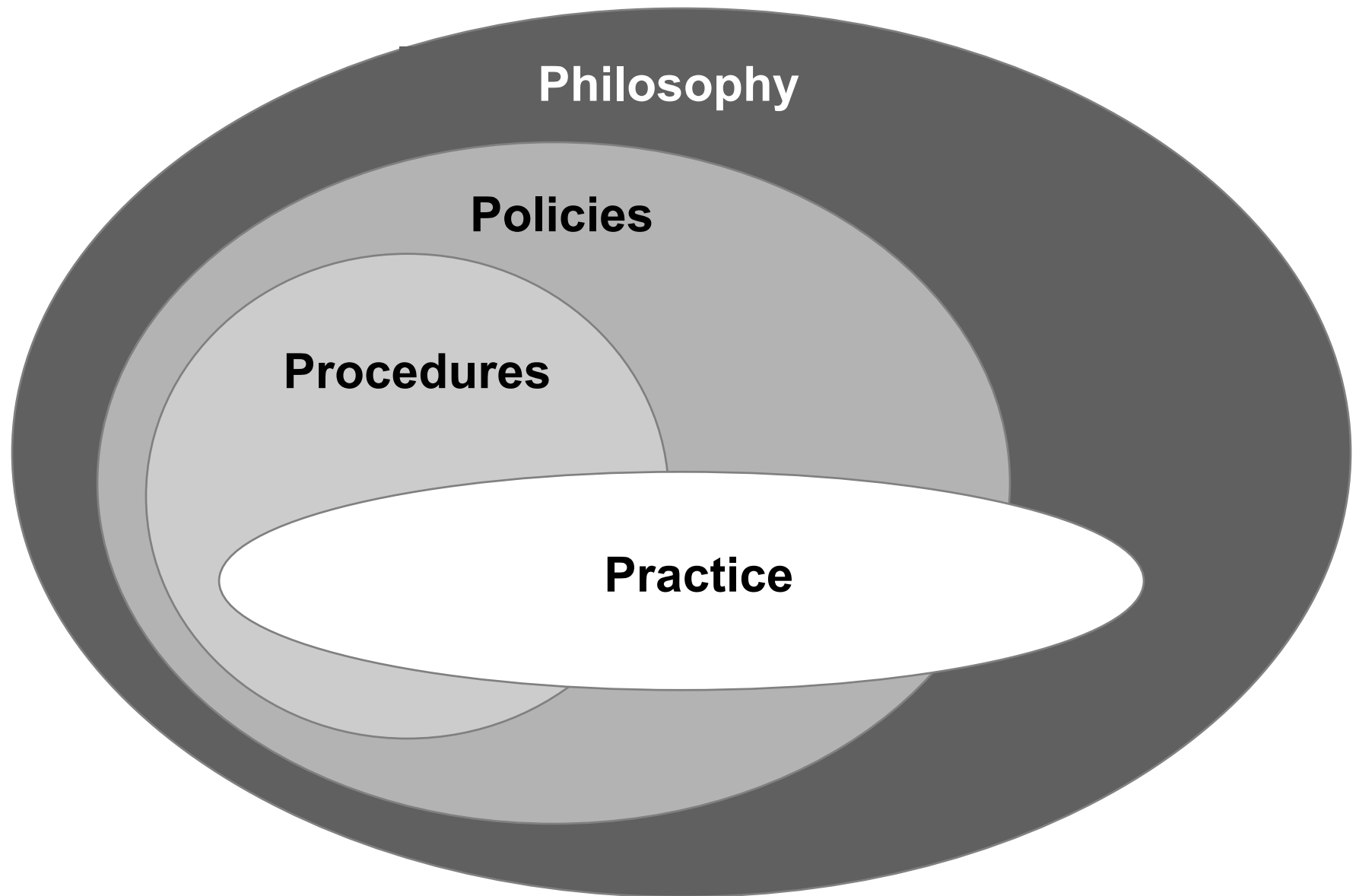
THE Model







The 4P's



Thank you!

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