

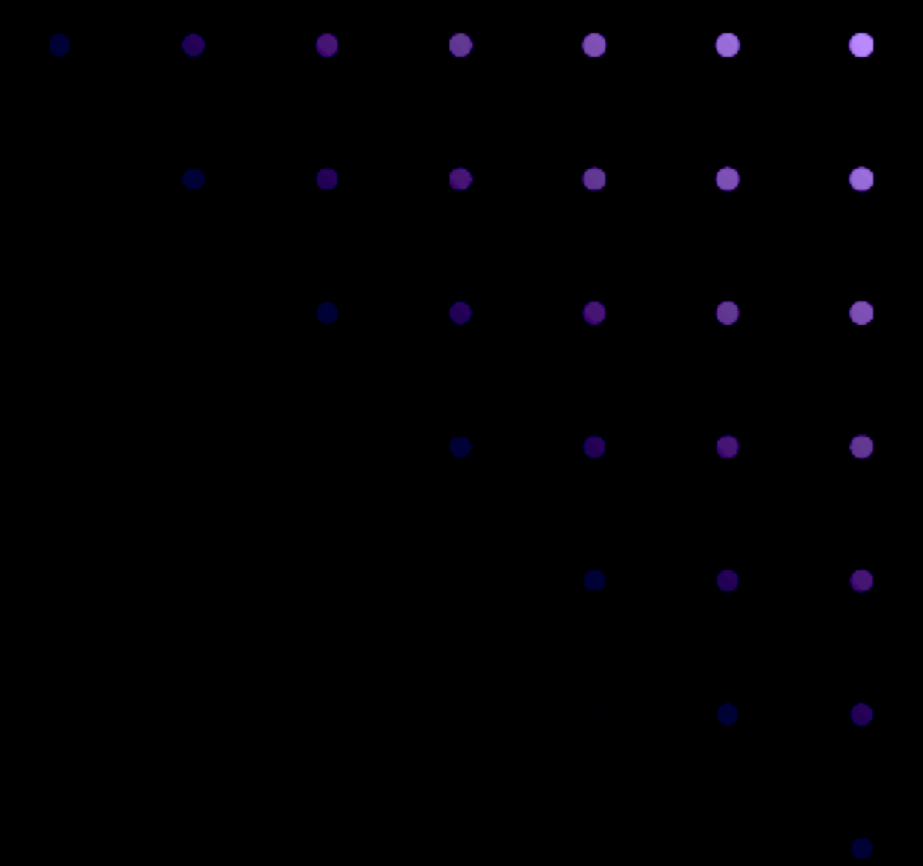
Dark Metrics

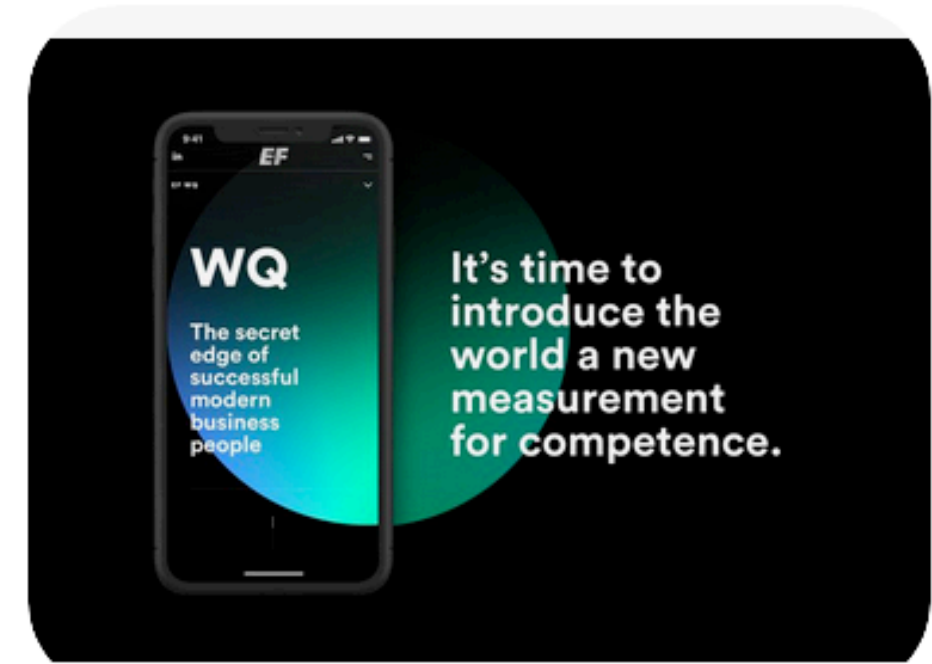
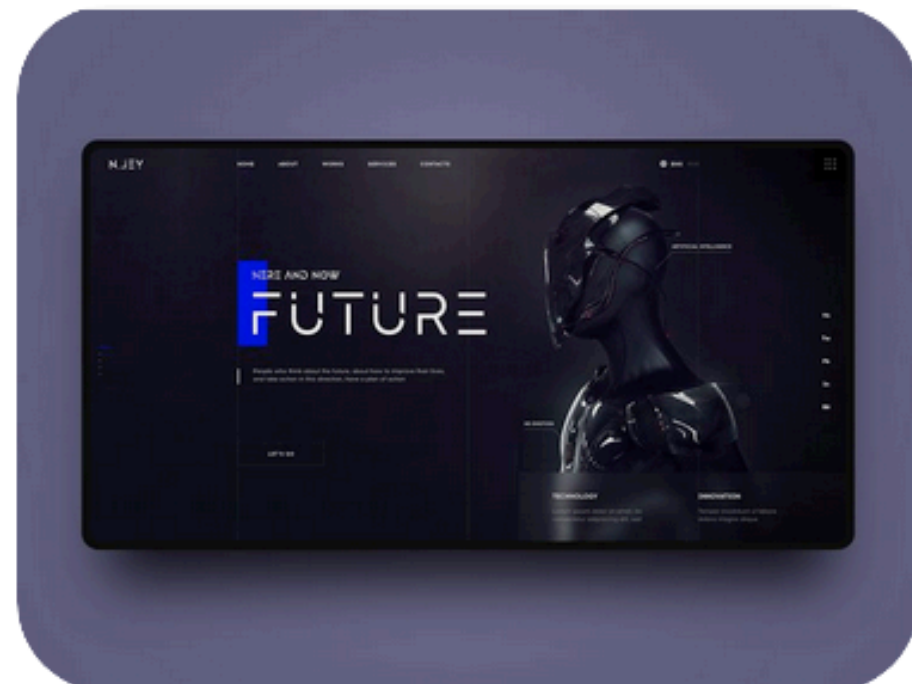
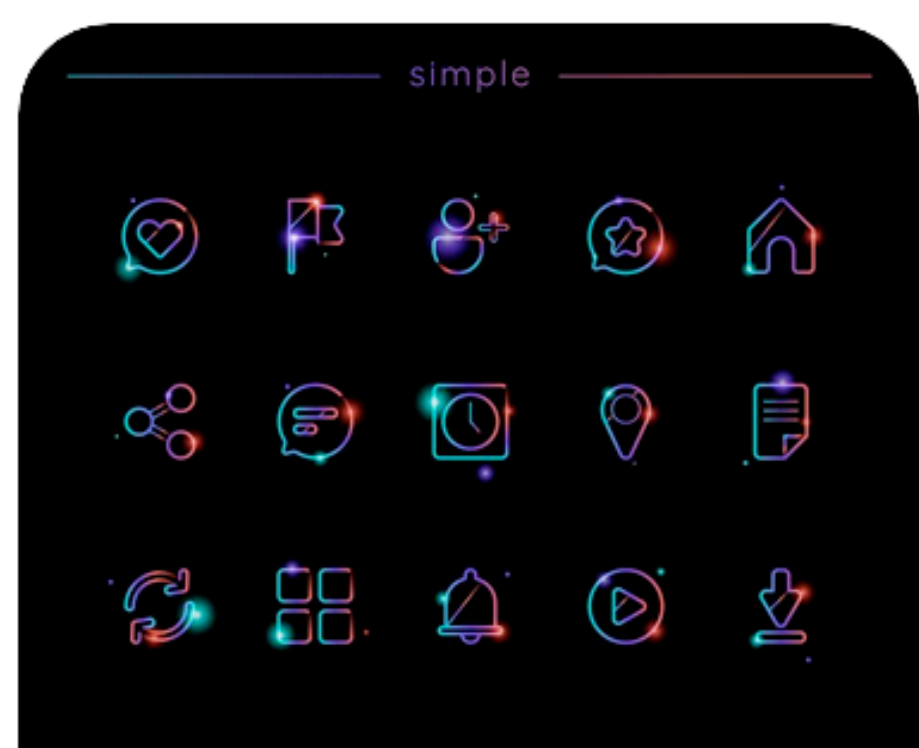
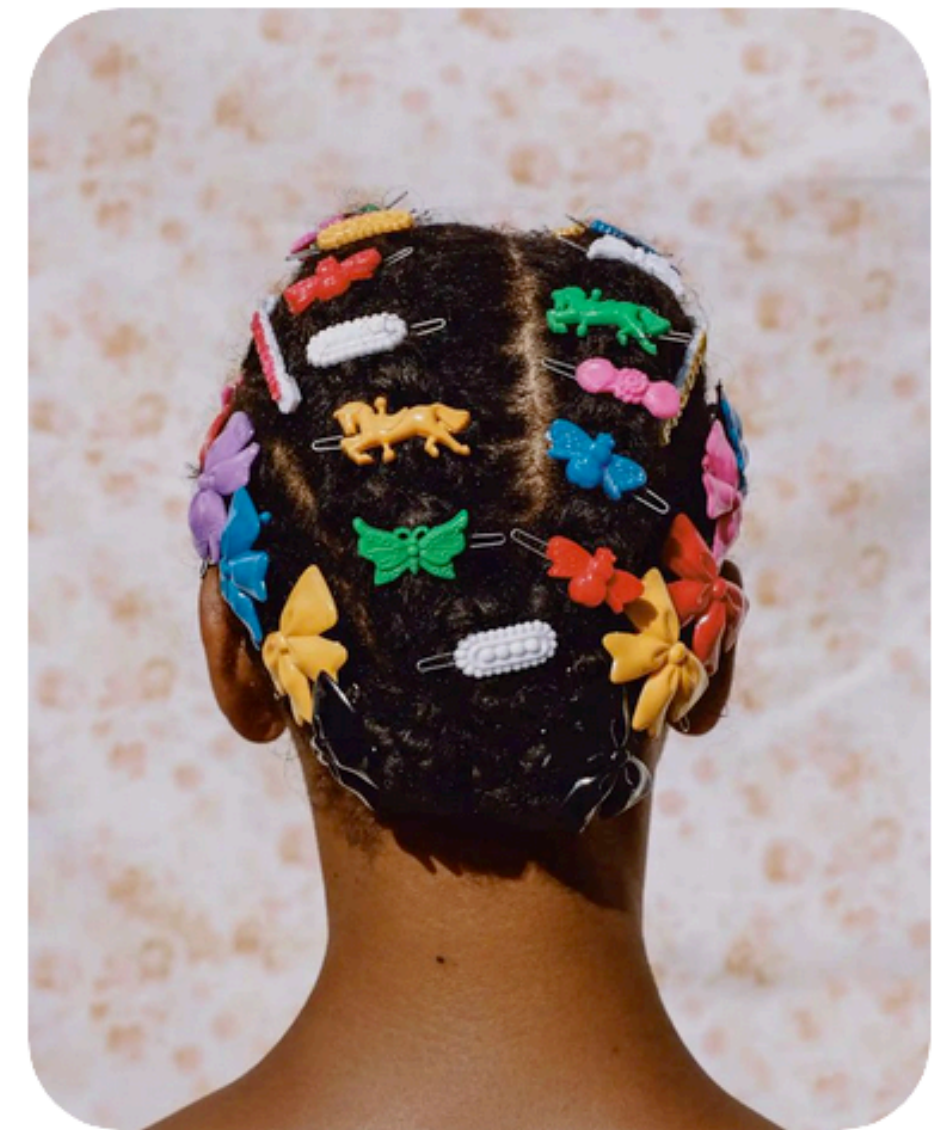
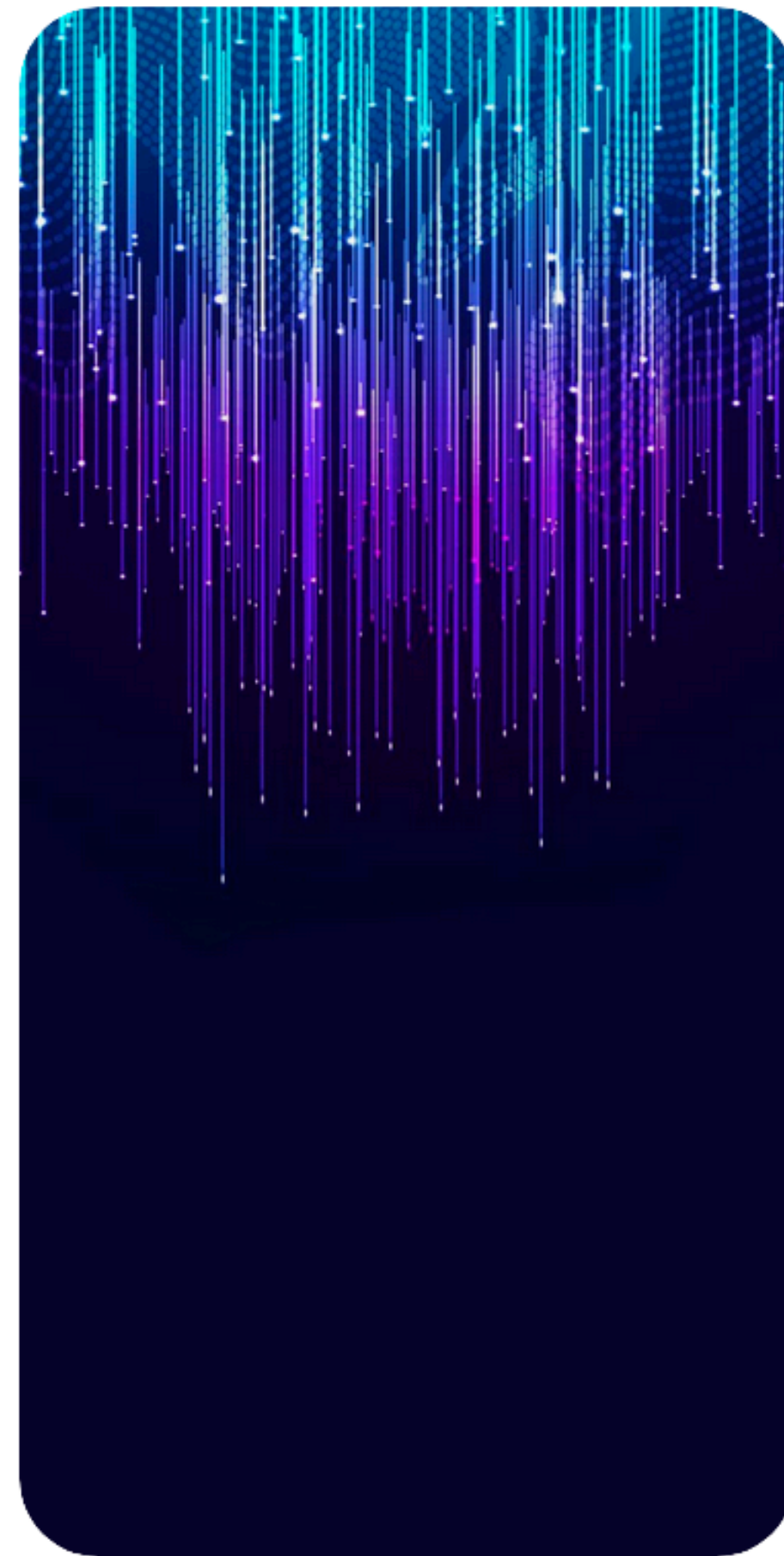
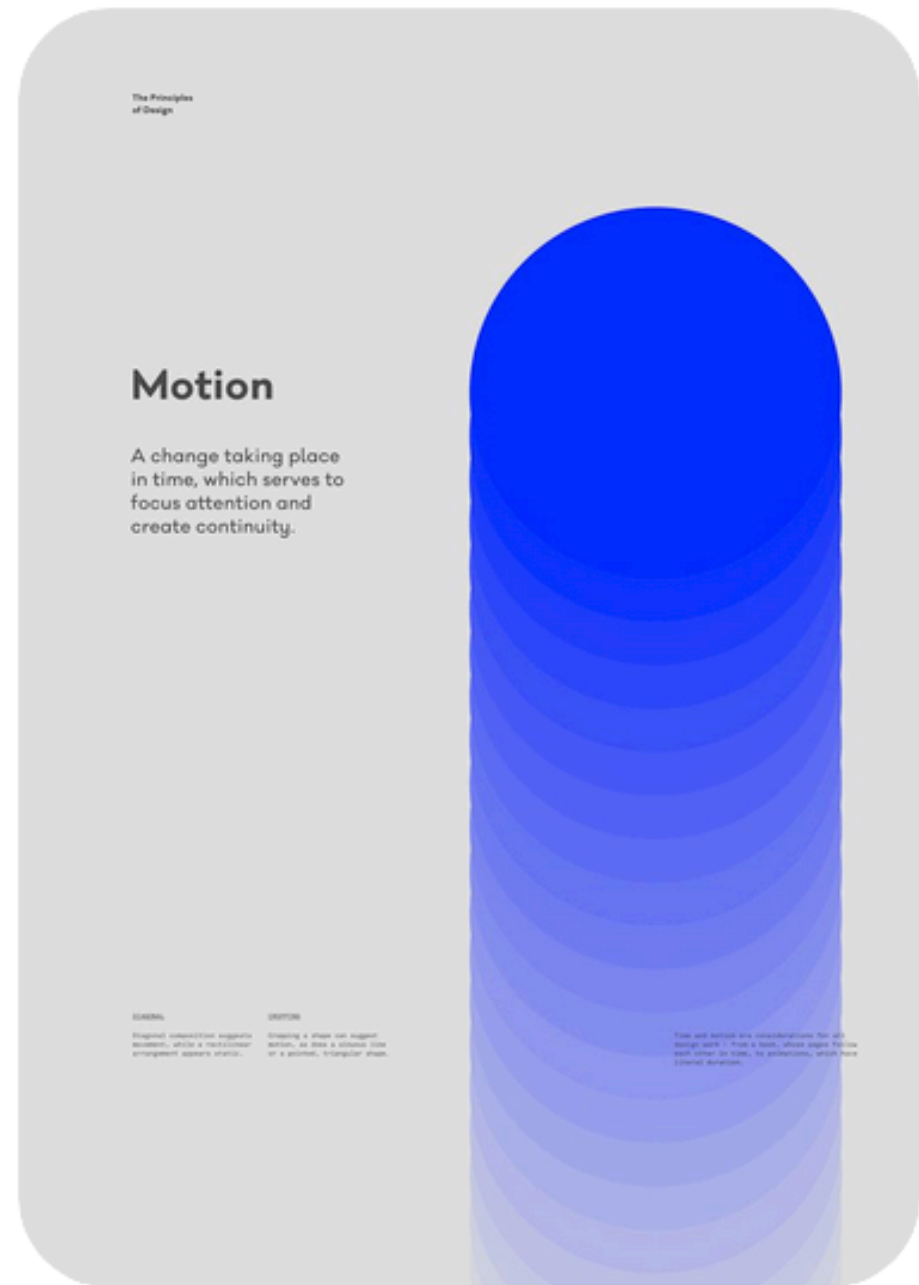
Illuminating the Negative Impact
of Digital Health Design

Presented by

Raven L. Veal, PhD

Design Researcher, IBM Watson Health





A Pinterest is worth a thousand words

Talking Points

PART I

Context

- Data-Driven Explosion
- Then—Product Success
- Now—Risk Assessment

PART II

Framework

- Dark Metrics Overview
- Framework

PART III

Case Studies

- Disempowerment
- Exclusion
- Addiction
- Distraction

PART IV

Final Thoughts

- Call to Action

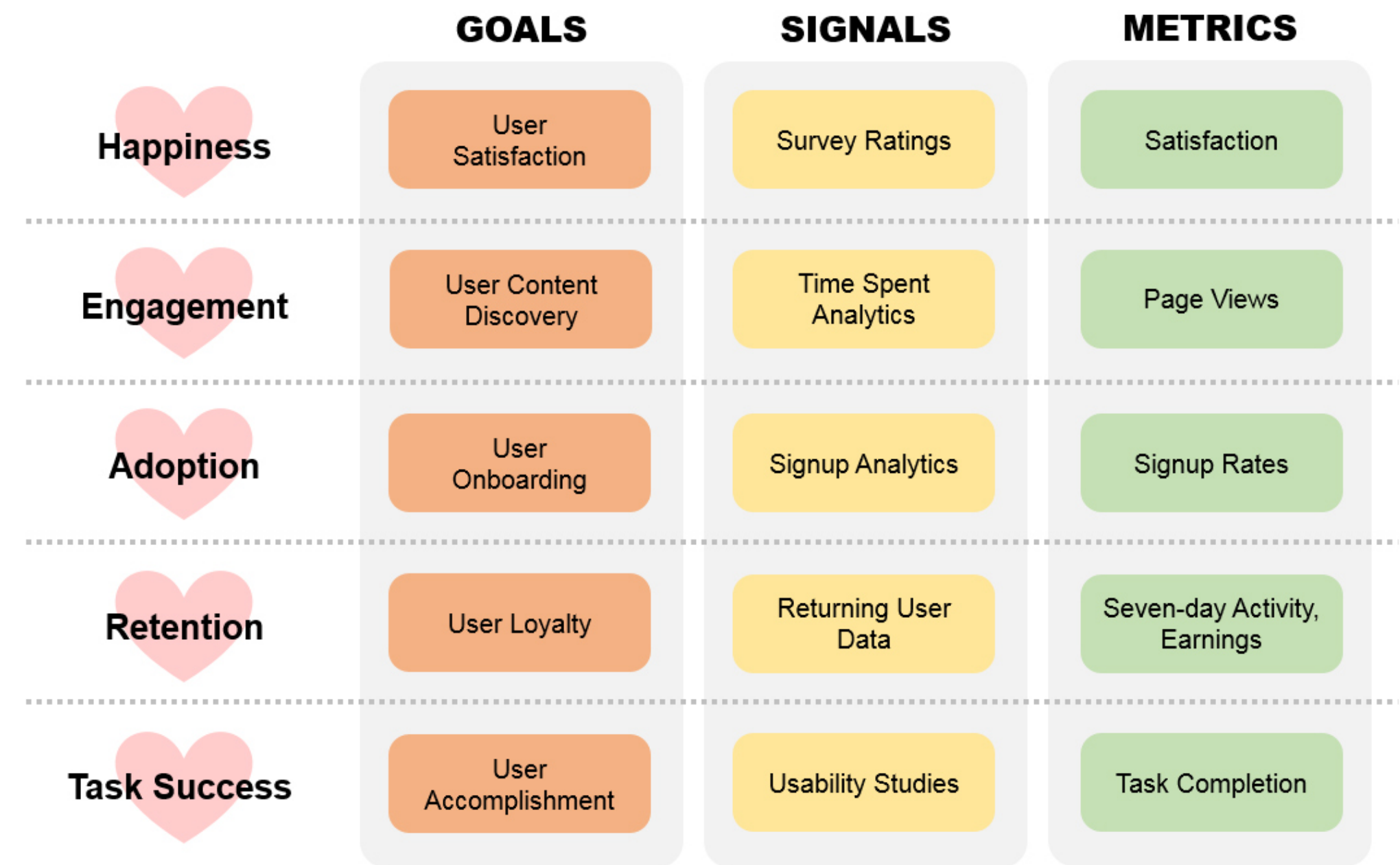
PART I

The Data-Driven “Explosion”

Then—Success Metrics

Traditional product metrics across digital technologies focus primarily on **near-term, product-oriented impact.**

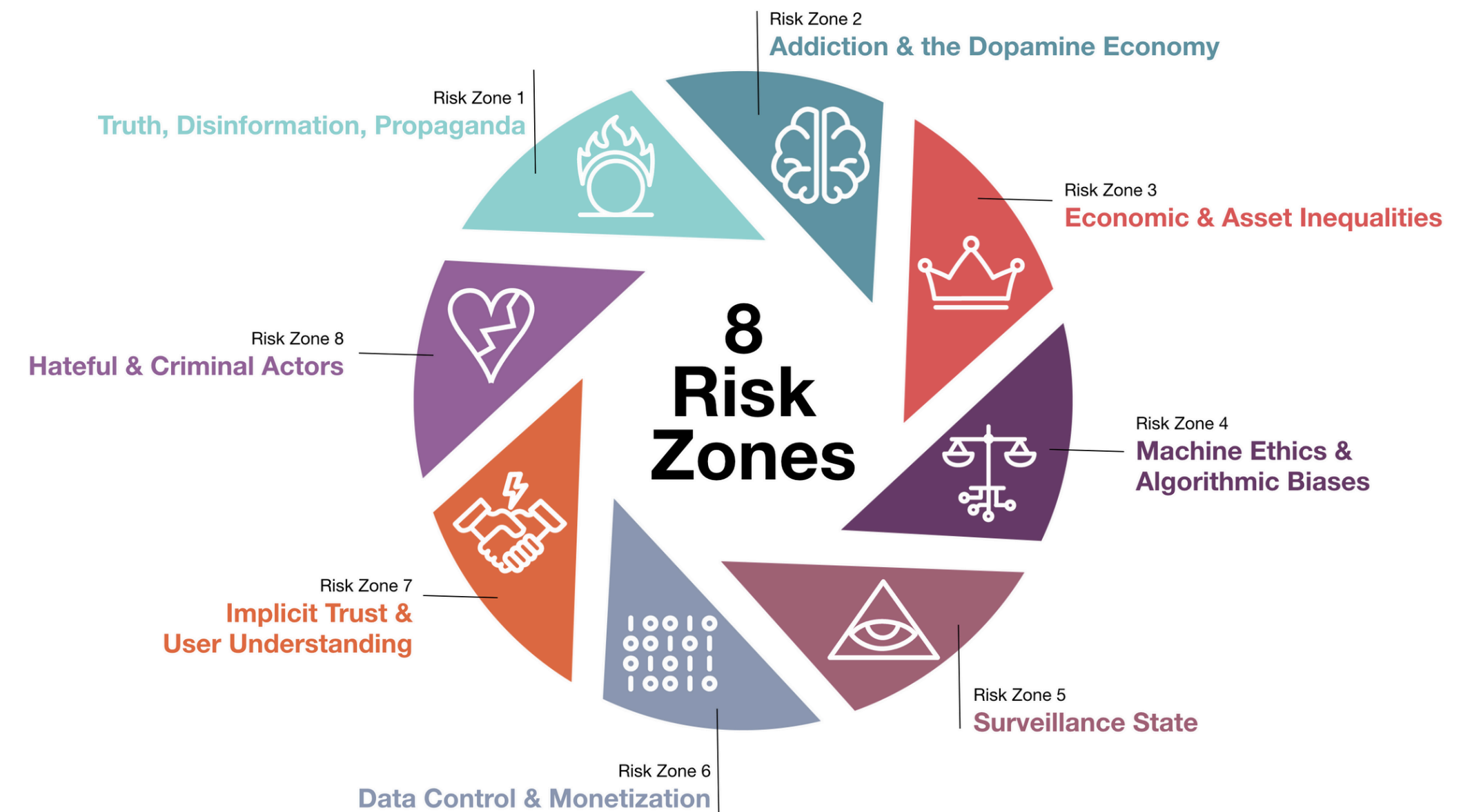
Figure 1. Google HEART Framework



Now—Risk Assessment

Emerging metrics across digital offerings are moving toward assessing the potential **biases, risks, and harm of our technologies.**

Figure 2. Ethical OS Risk Zones



Source: 2018 Institute for the Future and Omidyar Network

PART II

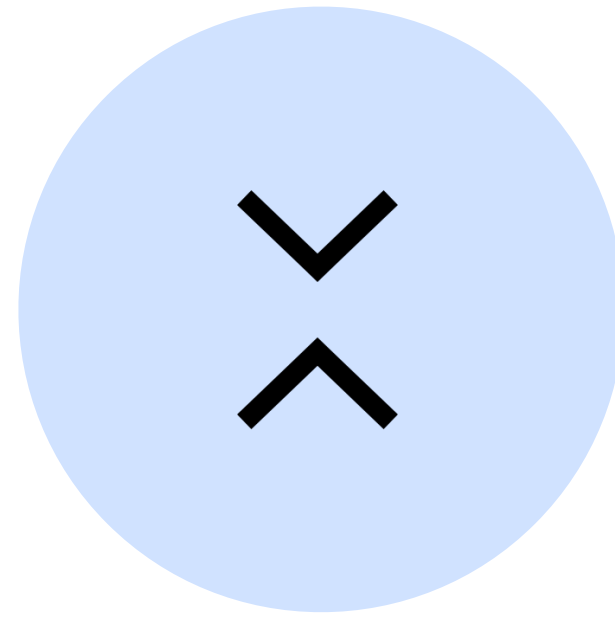
Dark Metrics—A New Paradigm

Dark Metrics—Overview

Dark metrics is a framework for measuring the **unintended negative consequences** of digital health technologies *at the individual level.*

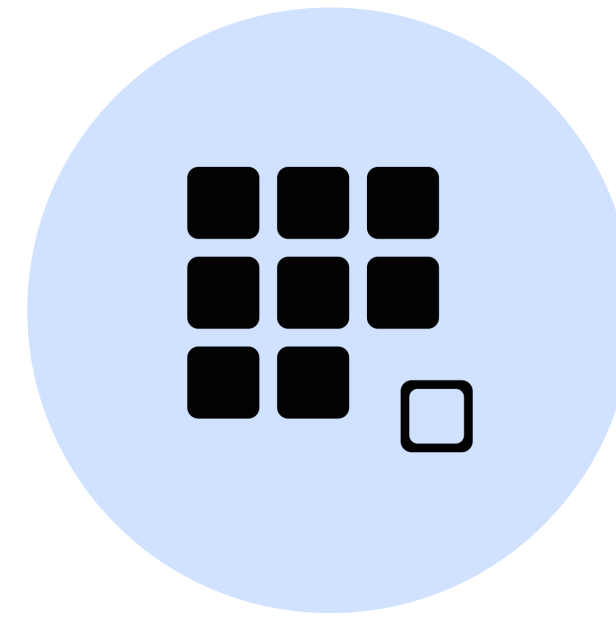


Dark Metrics—Overview



—Disempowerment

Does the technology replace or weaken users' authority in decision-making (or) is it being used to disempower others?



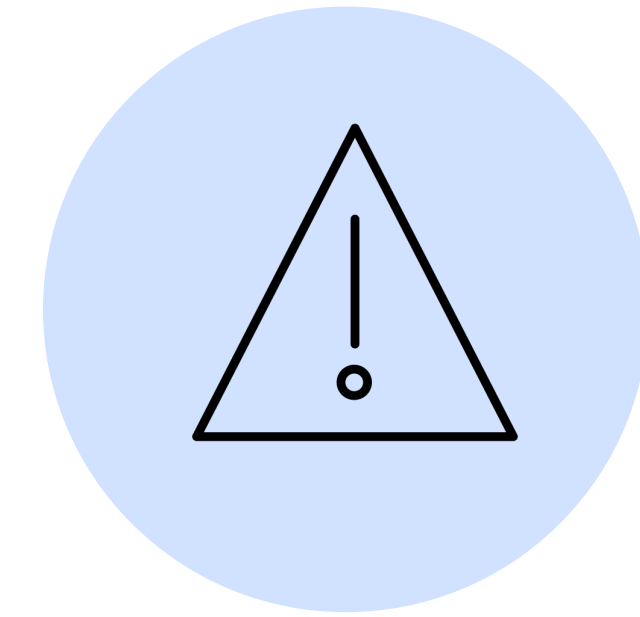
—Exclusion

Does the technology introduce unjust or prejudicial treatment (or) is it being used to inflict such treatment against others?



—Addiction

Does the technology promote excessive use or unhealthy engagement?



—Distraction

Does the technology divert attention away from the participants' natural workflow?

PART III

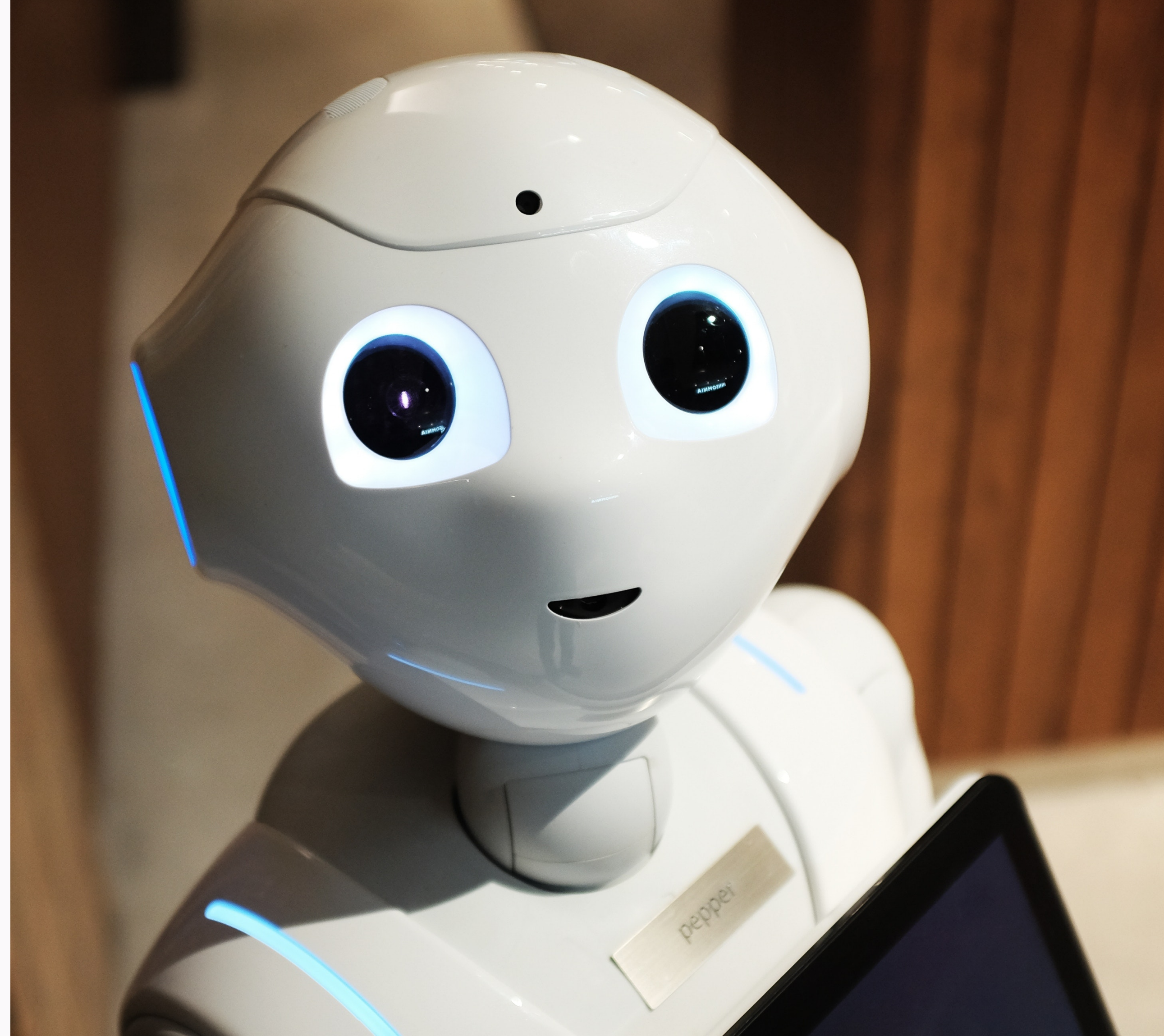
Dark Metrics—Case Studies

~~Disempowerment~~

Disempowerment

Does the technology **replace** or **weaken an individual's autonomy** in decision-making (or) is it being used to disempower others?

Example: *"Black-box" AI technologies for decision-support*



Disempowerment

Case study, Improving decision-making among university students with depression

- **Challenge.** How might we equip undergraduate students with depressive symptoms with the appropriate skills and information to obtain help for their condition?
- **Measurement.** Self-efficacy scores to assess how confident students feel in obtaining support for their condition; AI ethics principles.



~~Exclusion~~

Exclusion

Does the healthcare technology introduce **unjust or prejudicial treatment** (or) is it being used to inflict such treatment against others?

Example: *AI encoding of racial discrimination*



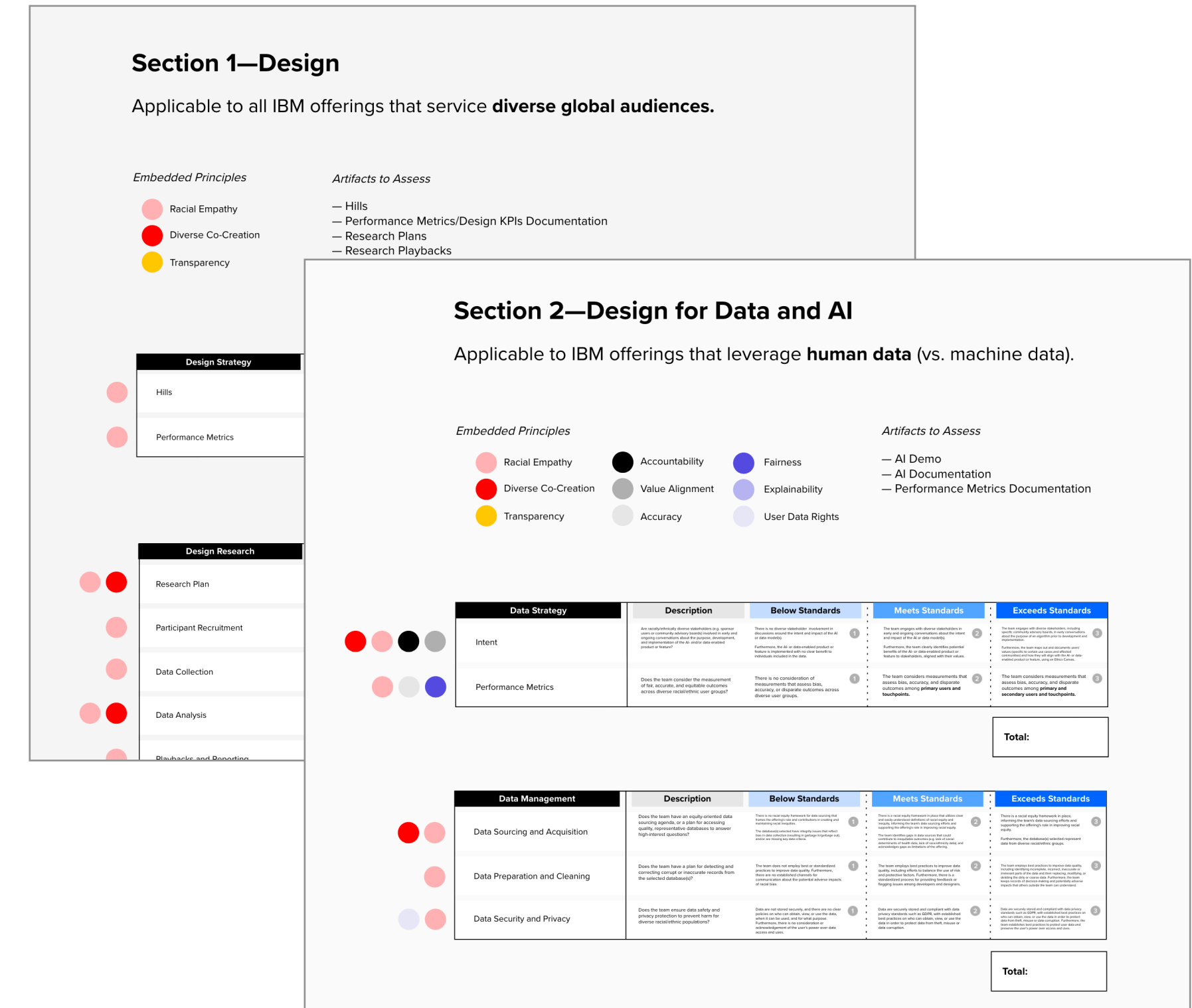
Exclusion

Case study, Improving racial equity among enterprise technologies

— **Challenge.** How might we support teams in designing product offerings that are more inclusive of racially/ethnically diverse end-users in order to improve trust and brand loyalty among global IBM clients and partners?

— **Measurement.** Heuristic evaluation using a design rubric that helps teams assess their products for racial bias across: *design strategy, design research ops, product design, data strategy, data visualization design, AI design.*

Figure #. Enterprise Design Racial Equity Rubric



~~Addiction~~

(Technology) Addiction

Does the technology promote **excessive use** or **unhealthy engagement/dependency**, causing deterioration of the mental, physical or social health of those who use it?

Example: *Gamified Health Technologies*



~~Distraction~~

Distraction

Does the technology provide an **overwhelming** amount of new or **complex** information or interactions that **divert peoples' attention away** from their natural workflow?

Example: *Electronic medical records and patient communication*



Distraction

Case study, Simplifying clinical trial recruitment in ER settings

- **Challenge.** How might we support medical staff in recruiting participants for clinical trials while maintaining an appropriate patient bedside manner?
- **Measurement.** Field study observations, shadowing both ER physicians and pharma staff, looking for clinician behaviors that demonstrate cognitive burden and distraction and patient frustrations



Dark Metrics—Overview

	Description	Signals	Metrics
Dimensions ↑ ↓	Disempowerment Does the healthcare technology replace or weaken users' authority in decision-making (or) is it being used to disempower others?	Survey Ratings	Self-efficacy scales
	Exclusion Does the healthcare technology introduce unjust or prejudicial treatment (or) is it being used to inflict such treatment against others?	Heuristic Evaluation	Racial equity scores
	Addiction Does the healthcare technology promote excessive use or unhealthy engagement, causing deterioration of the mental, physical or social health of the people who use it?	Diary Studies / Beta Testing	Time spent / wellbeing analytics
	Distraction Does the healthcare technology provide an overwhelming amount of new or complex information or interactions that divert attention away from the natural workflow?	Field Studies	Cognitive distraction metrics

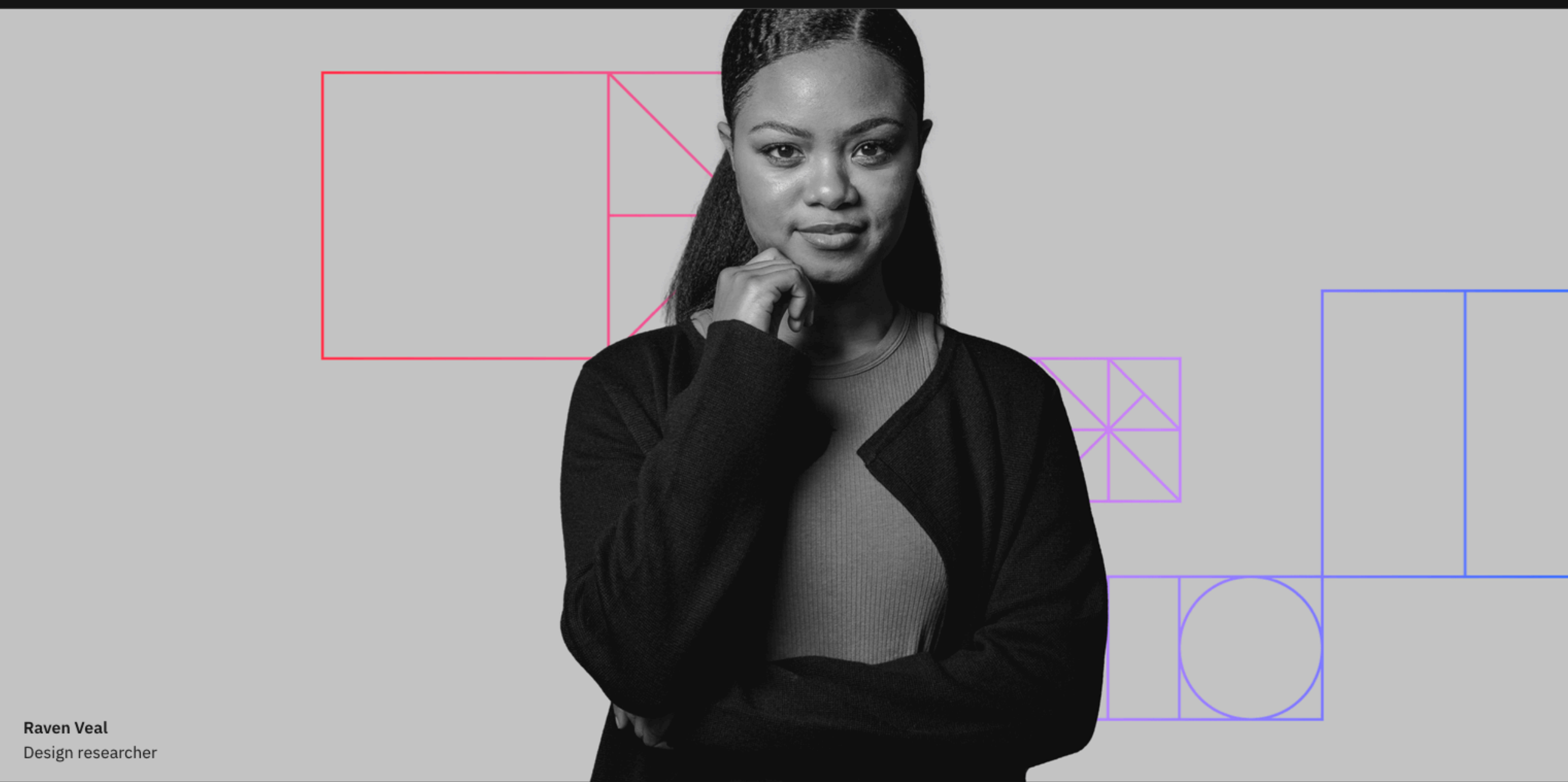
Final Thoughts (Call to Action)

The time is now to apply an **ethical lens** to the data that drive decisions.

- *How might we raise **awareness** among CFTs and clients?*
- *How might we **re-imagine** the way data are collected?*
- *How might we better tell the **complete story**?*

PART IV

Final Thoughts (Call to Action)

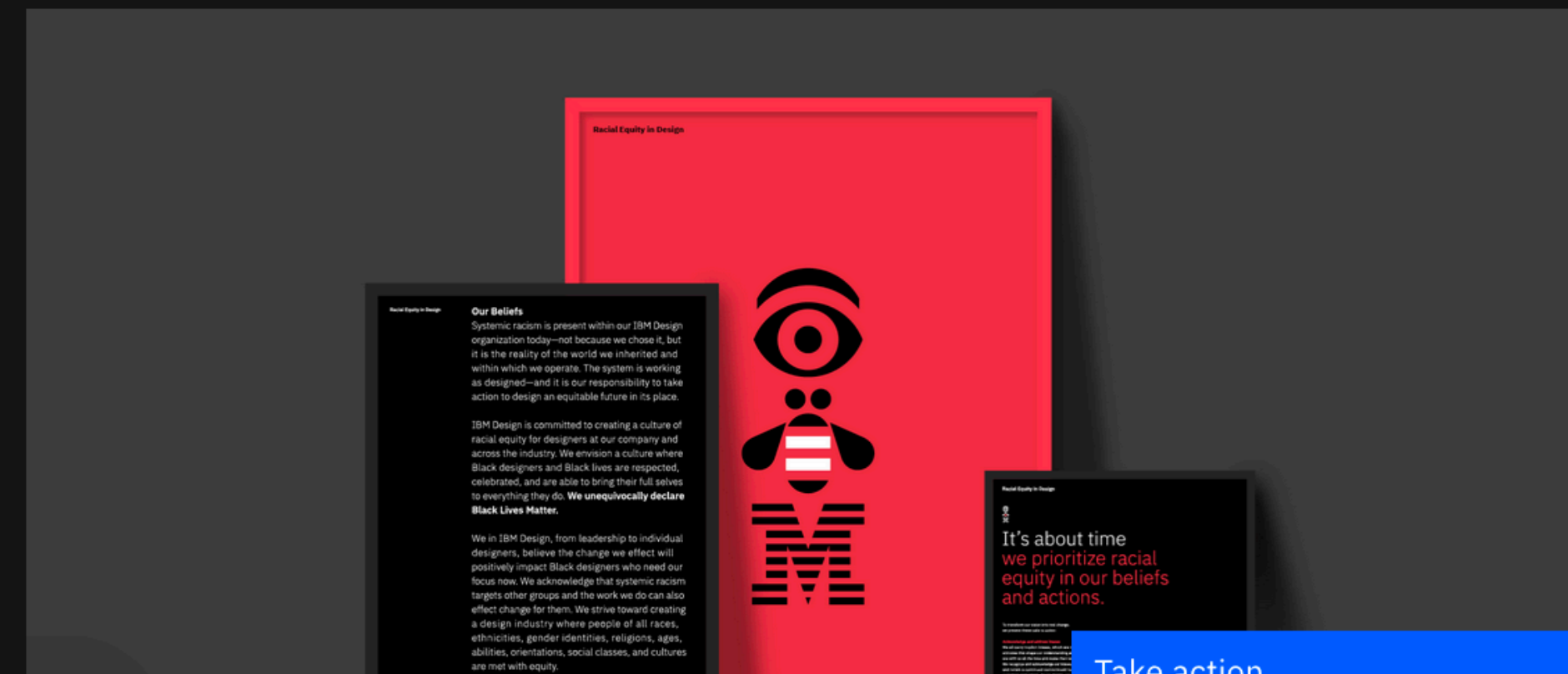


Raven Veal
Design researcher

The Racial Equity in Design initiative is committed to ensuring racial equity is instilled in the design culture inside and outside of IBM by driving change through our interactions, investments, and actions that impact behaviors, policies, and deep-seated assumptions.

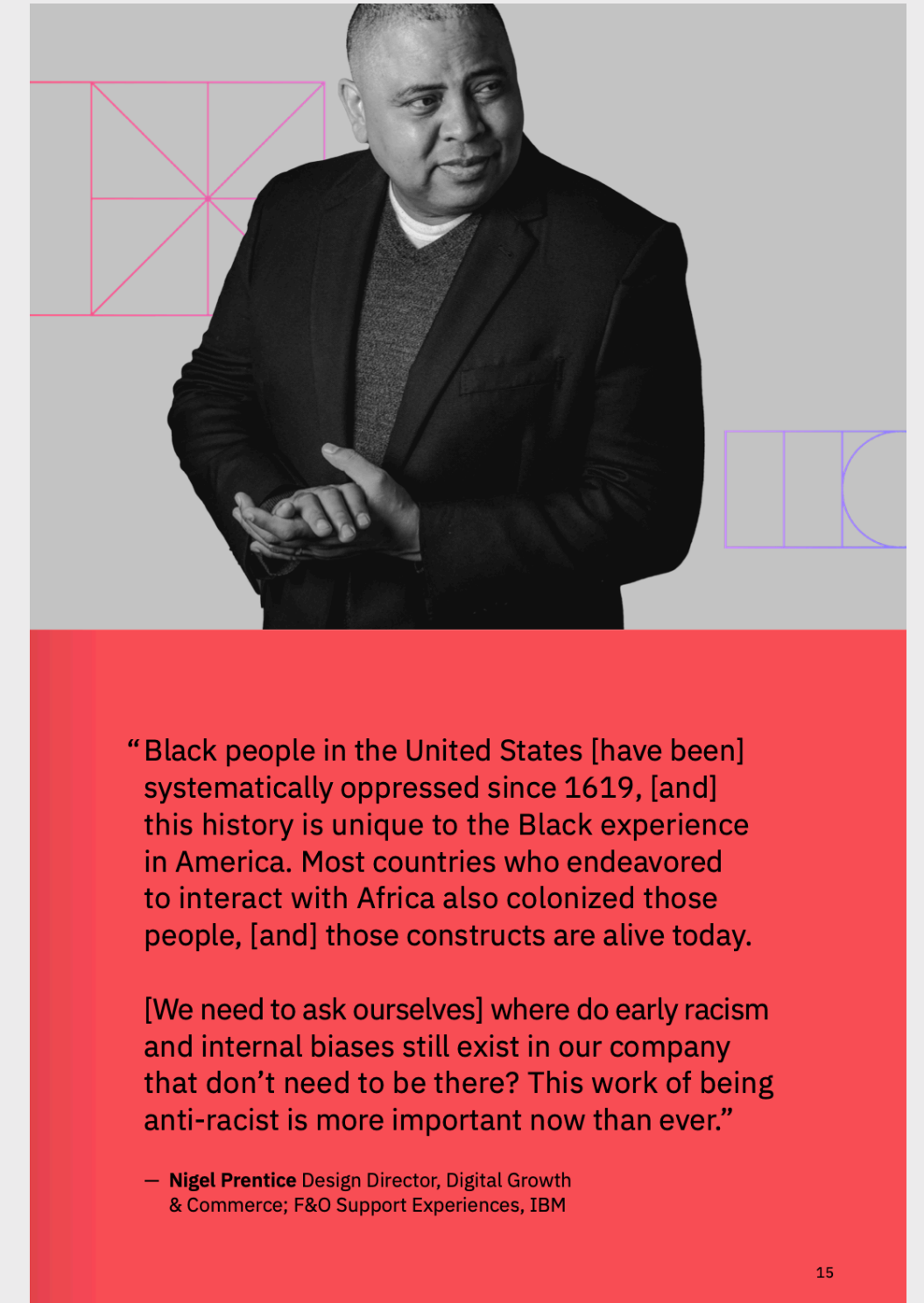
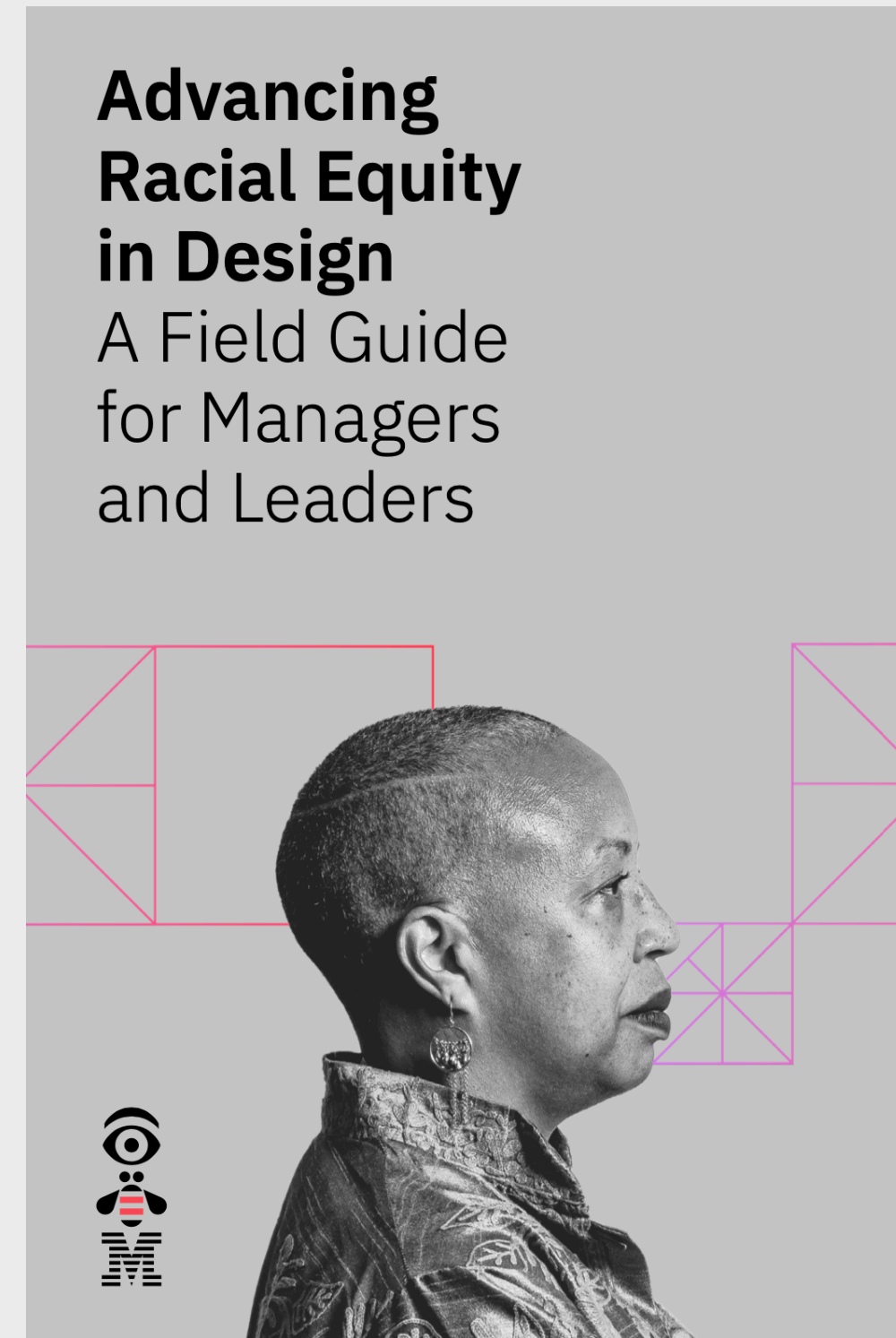
Featured

Our call to action is a community-crafted statement which defines the IBM Design point of view on racial equity as the foundation for how we work. Guided by our human-centered beliefs, it contains practical steps that designers will take towards creating a culture of equity at IBM and the design industry.



PART IV

Final Thoughts (Call to Action)



/ THE-END

Discussion/Q&A