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ADCI Closure Theorem

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v2.1 is a formatting update. The proof, definitions, and logical content are unchanged.

Abstract

This note defines the ADCI value layer: Agency (A), Dignity (D), Continuity (C), and Interpretive Authority (I) as four irreducible primitives required for structural personhood legitimacy in decision-permitting systems. We prove that these four primitives form a minimal sufficient and necessary set. The value layer is closed: no additional independent primitives are required.

1 Definitions

Let h be a human subject interacting with system S .

Agency (A)

$A(h,S) = 1$ if the subject can meaningfully participate in decisions affecting them. $A(h,S) = 0$ if the subject is coerced or structurally unable to participate.

Dignity (D)

$D(h,S) = 1$ if the subject is treated as an end in themselves. $D(h,S) = 0$ if the subject is treated as a mere object, category, or instrument.

Continuity (C)

$C(h,S) = 1$ if the subject's identity persists coherently across time. $C(h,S) = 0$ if the subject experiences temporal erasure or forced resets.

Interpretive Authority (I)

$I(h,S) = 1$ if the subject has authorship over the meaning of their own data, identity, and expressions. $I(h,S) = 0$ if the system imposes external interpretations that displace the subject's meanings.

2 Value Validity Function

$V_{\text{valid}}(h,S) = 1$ if and only if:

$$A(h,S) = 1 \wedge D(h,S) = 1 \wedge C(h,S) = 1 \wedge I(h,S) = 1$$

Otherwise: $V_{\text{valid}}(h,S) = 0$

3 Structural Harm Taxonomy

Primitive = 0	Harm State
$A = 0$	Coercion
$D = 0$	Objectification
$C = 0$	Temporal Erasure
$I = 0$	Representational Displacement

These four harm types define the domain of value-layer structural failure.

4 Theorem Statement

For any subject h and system S , $V_{\text{valid}}(h,S) = 1$ if and only if $A(h,S) = 1 \wedge D(h,S) = 1 \wedge C(h,S) = 1 \wedge I(h,S) = 1$. Furthermore:

1. Sufficiency: If $A = D = C = I = 1$, no structural value-layer harm remains.
 2. Necessity: For each primitive $X \in \{A, D, C, I\}$, there exists a boundary case where $X = 0$ and structural harm occurs.
 3. Irreducibility: No primitive can be expressed as a function of the other three.
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5 Proof

5.1 Sufficiency

Assume $A = 1, D = 1, C = 1, I = 1$. Coercion occurs only if $A = 0$ — no coercion. Objectification occurs only if $D = 0$ — no objectification. Temporal erasure occurs only if $C = 0$ — no temporal erasure. Representational displacement occurs only if $I = 0$ — no displacement. Therefore, no structural value-layer harm exists and $V_{\text{valid}}(h,S) = 1$. QED

5.2 Necessity

Case 1: $A = 0$, others = 1 \rightarrow coercion $\rightarrow V_{\text{valid}} = 0$. Case 2: $D = 0$, others = 1 \rightarrow objectification $\rightarrow V_{\text{valid}} = 0$. Case 3: $C = 0$, others = 1 \rightarrow temporal erasure $\rightarrow V_{\text{valid}} = 0$. Case 4: $I = 0$, others = 1 \rightarrow representational displacement $\rightarrow V_{\text{valid}} = 0$. Each primitive prevents a distinct harm. QED

5.3 Irreducibility

Assume for contradiction: $I = f(A, D, C)$. Consider boundary case: $A = 1, D = 1, C = 1, I = 0$. Then $f(1,1,1)$ must equal 0. But validity requires $f(1,1,1) = 1$ when all primitives equal 1. Contradiction. Therefore I is irreducible. By symmetry, A, D , and C are also irreducible. QED

6 Conclusion

The set $V = (A, D, C, I)$ is sufficient, necessary, and irreducible. Therefore:

$$V_{\text{valid}}(h,S) = 1 \text{ iff } A = 1 \wedge D = 1 \wedge C = 1 \wedge I = 1$$

The ADCI quartet forms the minimal sufficient value layer for personhood legitimacy in decision-permitting systems. QED

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