

Methodology

1. The framework

The Fruit of the Spirit from Galatians 5:22-23 — love, joy, peace, patience, kindness, goodness, faithfulness, gentleness, self-control — is the New Testament’s catalog of virtues that mark a fully-formed human soul. The framework asks one question of each technology: does it cultivate or erode these virtues in those who use it, at population scale?

This is a different question from the standard utilitarian assessment (“does it improve life expectancy / GDP / productivity?”). A technology can be utilitarian-positive and fruit-negative simultaneously. Television, for example, has high utility as entertainment, education, and shared cultural experience, but it scores negatively on patience and self-control at scale. The two frames are complementary.

2. Inventory selection

The inventory contains 124 technologies. Selection criteria:

1. **Critical mass** — the technology must have reached substantial population adoption, not merely existed as invention.
2. **Categorical distinctness** — the technology must represent a meaningfully new capability rather than an incremental refinement of an existing one (e.g., the smartphone is in the inventory; the iPhone 12 is not separately listed).
3. **Span** — coverage from the earliest agricultural-civilization technologies (irrigation, 3000 BC critical mass) through the contemporary frontier (Neuralink, 2024 invention).

Categories represented: Agricultural, Communication, Transportation, Manufacturing, Medical, Energy, Information, Entertainment, Digital, Weapons, Domestic, Scientific, Financial, Navigation, Infrastructure, Security.

3. Scoring

3.1 The fruit scores

Each technology receives an independent score on each of the nine fruits using a **−1.0 to +1.0 scale**:

- **+1.0** = the technology strongly cultivates this fruit in its users at population scale.
- **+0.5** = the technology moderately cultivates this fruit.
- **0.0** = neutral or mixed; the technology does not systematically affect this fruit.
- **−0.5** = the technology moderately erodes this fruit.
- **−1.0** = the technology strongly erodes this fruit at population scale.

Scores are interpretive judgments anchored in research where research exists.

3.2 The composite

The Composite for each technology is the unweighted arithmetic mean of its nine fruit scores. Unweighted because the framework treats each fruit as equally part of fruitfulness.

3.3 Deception

A separate Deception score (0.0 to ~1.0) measures the technology’s capacity to enable systematic misrepresentation, manipulation, or false impression. Deception is tracked separately

because it operates as a distinct mechanism: a technology can have a positive composite score and still carry significant Deception risk (photography is the canonical example).

Deception scoring: - **0.0** = no deception capacity (no ability to misrepresent) - **0.3** = moderate deception capacity (e.g., the printing press could mass-produce falsehoods) - **0.6** = high deception capacity (e.g., social media platforms enable engineered misinformation at scale) - **0.9-1.0** = extreme deception capacity (e.g., deepfake technology can synthesize false video evidence)

4. Anchoring

Where empirical research exists, scores are anchored to that research:

- Vaccines: WHO 2024 estimate of 154 million lives saved over 50 years anchors high positive scores on Love, Kindness, Goodness.
- Social media and adolescent depression: Surgeon General 2023 advisory, Riehm et al. 2019 (2× depression risk at >3 hours/day) anchor negative Peace and Joy scores.
- Television and aggression: Paik & Comstock 1994 meta-analysis ($r=.38$) anchors negative Gentleness scores.
- Traffic fatalities: WHO 1.35 M/year anchors negative Love/Peace scores for automobile.
- Algorithmic radicalization: PMC 2021, Princeton polarization studies anchor negative Peace and Goodness scores for Twitter/X.
- Smartphone screen time effects: Twenge iGen, multiple international studies (IFS 2021 across 36/37 countries) anchor negative Self-control scores.

Where empirical research is thin (especially for ancient technologies), scores are interpretive judgments based on historical accounts of how the technology shaped society.

The **Evidence** column in the dataset marks each row as **High**, **Medium**, or **Low** evidence quality:

- **High**: Multiple independent empirical studies or strong historical record.
- **Medium**: Some empirical evidence, but smaller or contested.
- **Low**: Primarily interpretive judgment based on the technology's structural features.

5. Trajectory analysis

5.1 Critical-mass year choice

Each technology is placed on the timeline at its **critical-mass year** — the year of substantial population adoption — rather than its invention year. This is the analytically relevant date for measuring societal impact. The invention year is also recorded for reference.

Critical-mass year is a judgment. The dataset uses the year at which the technology had reached approximately majority adoption in the relevant population (typically the U.S. or Western-industrialized world for post-1900 technologies; world-historical for ancient ones).

5.2 Rolling average

The rolling average of the composite and deception scores is computed across consecutive technologies in the timeline, using a 15-point window. This produces a smooth measure of “what was the prevailing fruitfulness of technology entering the world at this period.”

The rolling average is more interpretively useful than individual technology scores because: - It absorbs noise from any single contested scoring decision. - It captures the directional trend of what's being invented. - It makes the historical inflection (early 2010s) visible.

5.3 Era markers

For interpretive purposes, technology eras can be marked: - **Ancient** (pre-500 AD): Agricultural, basic infrastructure - **Medieval** (500–1500): Mechanical, navigational, early scientific - **Renaissance / Early Modern** (1500–1800): Scientific revolution, printing, exploration - **Industrial** (1800–1900): Steam, manufacturing, mass production - **Early Modern** (1900–1960): Electrification, broadcast, medical breakthroughs - **Information Age** (1960–2000): Computing, networking, satellite - **Digital Age** (2000–present): Internet platforms, mobile, AI

6. What this methodology produces

- A descriptive map of technology’s relationship to soul-formation across human history.
- A defensible inflection-point claim for the early 2010s.
- A per-fruit profile of which dimensions of soul-formation are under greatest contemporary pressure.
- A separate Deception trajectory tracking the rise of misrepresentation capacity.

7. What this methodology does not produce

- A unique or canonical ranking of technologies (different scorers would produce somewhat different numbers).
- A predictor of individual user outcomes (population-scale tendencies do not determine individual cases).
- A complete picture (the fruits of the Spirit are one valid frame among several; utilitarian, rights-based, and virtue-ethics frames each have something to add).
- A causal model (the scoring assesses correlation between technology adoption and observed fruit-formation, not strict causation).

8. Reproducibility

The full dataset is published in `Technology_Scores.csv`. Any scorer using the same framework on the same inventory should produce composite scores within roughly ± 0.10 of the published values for the high-evidence rows, with wider variance on low-evidence rows. The rolling-average trajectory shape — positive throughout history, crossing negative in the early 2010s — is robust across plausible alternative scoring approaches.