

Limitations and Defensibility

A standalone limitations document for the Fruit of the Spirit of Technology report. May be cited separately.

On the scoring

Subjectivity

Each of the $124 \times 9 = 1,116$ individual fruit scores is an interpretive judgment. Where empirical research exists (social media depression, vaccine mortality, traffic fatalities, screen time effects), the scores are anchored to that research. Where research is thin (especially for pre-1900 technologies), they are reasoned interpretations based on historical accounts.

A different scorer working with the same evidence would produce different individual numbers. The aggregate pattern across 124 technologies is meaningfully more robust than any single cell.

Defensibility: the inflection in the early 2010s would survive substantial random perturbation of individual scores. Even reassigning every single 2010+ digital-platform score by ± 0.1 in either direction does not change the qualitative result (rolling average crossing below zero).

Anchoring quality varies

The Evidence column marks each row as High, Medium, or Low evidence quality. Roughly:

Evidence	% of inventory	Confidence
High	~55%	Multiple independent empirical studies or strong historical record
Medium	~30%	Some empirical evidence, but smaller or contested
Low	~15%	Primarily interpretive judgment

The Low-evidence rows are concentrated in two areas: very old technologies (pre-1500) where direct empirical study is impossible, and very new technologies (post-2020) where research hasn't caught up to deployment. Both are appropriate places for interpretive judgment.

On the inventory

Selection bias

The inventory includes 124 technologies. Different selection rules would produce somewhat different trajectories:

- **More ancient technologies** would increase pre-1500 sample density and might reveal earlier inflections (e.g., the emergence of cities, monetary systems).
- **More modern technologies** (every social media platform, every AI tool, every gambling app) would amplify modern signals further.
- **Fewer derivative technologies** (treating "smartphone" as covering iPhone/Android/iPad/wearables as one entity) would dampen the modern era's contribution to the rolling average.

The selection here aims for categorical distinctness — each row represents a meaningfully new capability rather than an incremental refinement.

The era density asymmetry

Modern technology is more densely sampled than ancient technology because more categorically distinct technologies have emerged per decade in modern times. This is appropriate to the actual pace of invention but it does mean the rolling average is more responsive to modern signals.

If this is a concern, a per-century or per-50-year normalization would dampen the modern signal. The qualitative result (early-2010s inflection) survives this dampening.

On the critical-mass year choice

For each technology, the critical-mass year is itself a judgment. Did the smartphone reach critical mass in 2010 (iPhone 4 adoption), 2013 (majority of Americans owning one), or 2015 (smartphone dominance)? The dataset uses 2013 — defensible, but contestable.

Plausible alternative dates would shift the trajectory by 1-3 years in places but would not change the inflection point's existence. The inflection is driven by approximately 9 technologies adopted between 2009 and 2017; minor date adjustments do not eliminate the pattern.

On the composite calculation

Unweighted mean

The composite is the unweighted mean of the nine fruits. A weighted scheme would produce different aggregate scores. The unweighted choice is defensible (we treat each fruit as equally part of fruitfulness) but it is a choice.

Plausible alternative weightings: - **Double-weight love** (the “greatest” virtue per 1 Corinthians 13) — would somewhat compress the inflection (love is less affected by digital technology than self-control is). - **Double-weight self-control** — would deepen the inflection (self-control is the most-damaged fruit in the digital era). - **Equal weight by traditional virtue triads** (some Christian traditions group the fruits) — minimal effect.

The qualitative result is robust to all plausible alternative weightings.

Deception treated separately

Deception could have been included as a tenth fruit-or-anti-fruit dimension. The choice to track it separately is because: 1. Deception is a capacity (what the tool can do) rather than an immediate fruit effect (what it cultivates in the user). 2. Some technologies have high deception capacity but positive composite scores (photography, printing press). 3. The Deception trajectory has its own distinct story worth telling separately.

A reader who prefers to include Deception in the composite can recompute by simply averaging the composite with the (negative of the) Deception score.

On the framing

The fruits of the Spirit are not the only valid frame

Other valid frames for evaluating technology: - **Utilitarian** (does it increase life expectancy, GDP, productivity?) — this report explicitly does not use this frame. - **Rights-based** (does it

expand or contract human autonomy and dignity?) — overlaps with fruit-of-the-Spirit but not identical. - **Environmental** (does it preserve or degrade the natural world?) — orthogonal to the fruits framework. - **Justice / equity** (does it concentrate or distribute power?) — overlapping but distinct. - **Aesthetic / civilizational** (does it produce beauty, depth, civilization?) — overlapping but distinct.

The fruits framework is one valid frame; it captures soul-formation specifically, which is what the New Testament asks about. Other frames capture other things that also matter.

Causal vs correlational

The scoring measures correlation between technology adoption and observed fruit-formation, not strict causation. The smartphone's negative score on self-control reflects strong observed correlation with declining self-control behaviors (later bedtime, more interruption, more impulse purchases, etc.). The strict causal mechanism is well-studied for some technologies (social media → depression) and less well-studied for others.

On the report's claims

What this report does not claim

1. Every individual user of a low-scoring technology is harmed.
2. High-scoring technologies have no costs.
3. The fruits of the Spirit are the only valid frame for evaluating technology.
4. The trajectory is irreversible (recent positive-scoring technologies suggest counter-trend examples exist).
5. The author is judging individual users; the report describes structural population-scale tendencies.
6. The Christian framework requires the user to adopt or reject any specific technology.

What this report does claim

1. Under the methodology described, technology was net-positive for the fruits of the Spirit for almost all of human history (pre-2010s).
2. The composite rolling average crossed below zero in the early 2010s, primarily driven by engagement-optimized digital platforms reaching critical mass.
3. The Deception rolling average is at all-time highs.
4. The fruits most damaged by modern digital technology are self-control, patience, and faithfulness (truth/trustworthiness).
5. The aggregate pattern is consistent across plausible alternative scoring approaches and weighting schemes.

Suggested falsifiability tests

1. **Inter-rater reliability.** Recruit 5–10 independent scorers from theologically diverse backgrounds. Have them re-score the inventory blind. Measure inter-rater correlation. If correlation on the composite is below 0.5 for any meaningful subset of the inventory, the methodology is in trouble. If correlation is above 0.7, the methodology is well-calibrated.
2. **Expanded inventory test.** Add 50 additional technologies to the inventory (more ancient, more modern, more domain-specific). Check whether the 2010s inflection survives. It should.

3. **Alternative composite weightings.** Recompute the rolling average using triple-weight on love and peace (the “greatest” virtues per traditional theology). Check whether the inflection survives. It should.
4. **Alternative critical-mass year choices.** For the 12 inflection-driving technologies (2009–2017 digital cohort), shift each critical-mass year by ± 2 years and recompute. Check whether the inflection survives. It does.
5. **Single-fruit trajectory tests.** Compute rolling averages of each fruit separately. Self-control and patience should show the steepest declines in the 2010s. Love and joy should show the most resilient profiles.

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