
Attention as an Economic Resource: An Integrative Conceptual Framework

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ABSTRACT

Digital technologies have expanded the supply of information well beyond what individuals can process. Human attention, constrained by finite time and cognitive limits, has therefore become a contested resource that platforms, advertisers, creators and firms compete to obtain. Research on attention is well developed within economics, cognitive psychology, marketing, information systems and media studies, yet it remains dispersed. What is **underdeveloped** is an integrative account of how attention moves from a scarce human capacity to an observable behavioural resource, becomes convertible into different forms of economic value and simultaneously generates social externalities. This conceptual paper develops such an account. It first specifies five properties that qualify attention as an economic resource and then sets out a seven-stage framework tracing information abundance through attention scarcity, capture, allocation, engagement, behavioural signals, conversion and value creation. The framework is cyclical rather than linear: behavioural data generated at Stage 5 feeds back into capture at Stage 2. A parallel pathway records externalities that remain unpriced in the private return. The paper addresses recent cognitive-science objections to treating attention as a unified allocable resource and defines the framework at the level of observable behaviour accordingly. Five propositions are advanced for empirical testing. The framework proposes that economic value is likely to depend more strongly on attention quality and convertibility than on attention volume alone.

Key Words: *Attention Economy; Attention Scarcity; Digital Platforms; Attention Monetisation; Consumer Engagement; Conceptual Framework*

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INTRODUCTION

The contemporary economy produces information at a scale and cost that would have been difficult to imagine a generation ago. Search engines, social media, streaming services, marketplaces and mobile applications place a continuous supply of content in front of users at close to zero marginal cost. Human cognitive capacity has not expanded to match. Individuals operate under finite time and cognitive constraints that have not changed materially as content supply has grown.

Simon (1971) identified this asymmetry early. Information consumes the attention of its recipients, so an abundance of information tends to create a scarcity of attention. Goldhaber (1997) carried the argument into the internet era and proposed attention as the organising economic category of networked environments. Davenport and Beck (2001) brought the idea into management, framing attention as a currency organisation must manage deliberately. Wu (2016) supplies the historical dimension, tracing the commercial capture of attention from nineteenth-century newspapers through radio and television to digital platforms.

Falkinger contributed the formal economic treatment in two related but distinct papers. Falkinger (2007) develops a model of competition for attention, specifying a space of receiving subjects with finite capacity and a set of competing senders with signalling technologies and characterising equilibrium audiences, signal exposure and the diversity of senders that survive the contest. Falkinger (2008) shifts the question from competitive structure to welfare, showing that conventional equilibrium results hold only while receivers retain spare attention capacity and addressing efficiency and optimal policy intervention once they do not. The first paper establishes that competition for attention is analytically tractable; the second establishes that its outcomes carry welfare consequences.

The economic significance of attention is most visible where money changes hands least. Many digital services carry a zero monetary price and users contribute time, interaction and behavioural information instead. Brynjolfsson et al. (2023) show that measuring consumer surplus through monetary expenditure alone substantially understates the welfare contribution of free internet services because it ignores the value of the time users devote to them. Their calibration places the average annual incremental welfare gain from the internet in the United States between 2002 and 2011 at approximately 38 billion dollars, close to 0.29 per cent of annual gross domestic product, against 2.7 billion dollars when time is not valued.

Attention monetisation also extends past advertising. Ørmen and Gregersen (2023) show that YouTube commodifies content, audiences, creative labour and commercial interaction together rather than simply selling audience exposure to advertisers. Heitmayer (2025) argues that attention on social platforms functions as a symbolic currency exchanged between users as well as between users and firms. González de la Torre et al. (2026) connect these business models to artificial intelligence and large-scale data analytics, describing a cycle in which attention capture and data extraction reinforce one another.

Existing scholarship therefore explains attention scarcity, cognitive allocation, platform engagement and monetisation, but it largely explains them separately. What remains underdeveloped is an integrative account of how attention moves from a scarce human capacity to an observable behavioural resource, subsequently becomes convertible into different forms of economic value under different business models and simultaneously generates social externalities that the private return

does not price. This paper asks how attention can be conceptualised as an economic resource in the digital economy and through what mechanisms it is transformed into economic value.

Several existing models capture important parts of this mechanism. They generally do so within particular economic or platform contexts and they rarely combine the economic account of scarcity with the cognitive account of selection, the marketing account of engagement and the analysis of externalities. The contribution offered here is that combination, together with three more specific elements: a resource definition stated carefully enough to survive current objections from cognitive science; a distinction among attention quantity, quality and convertibility; and five propositions that translate the framework into testable claims.

Section 2 states the scope of the synthesis. Section 3 sets out the conceptual foundations and addresses the principal objection to the resource framing. Section 4 defines the terms used throughout and specifies the properties of attention as an economic resource. Section 5 presents the framework. Section 6 develops the propositions. Sections 7 and 8 discuss contributions and implications. Section 9 states limitations and directions for research.

SCOPE OF THE SYNTHESIS

This paper is a conceptual synthesis rather than a systematic review. It does not report a protocol-driven search and it makes no claim to exhaustive coverage of a defined corpus. Its purpose is theory development and the source material was selected accordingly.

Two categories of work were drawn on. The first comprises the seminal contributions that established attention as an economic category: Simon (1971), Goldhaber (1997), Davenport and Beck (2001) and Falkinger (2007, 2008). The second comprises recent work published from 2014 onward across the disciplines that now analyse attention commercially: economics and information systems for scarcity, measurement and welfare; cognitive science and philosophy of mind for the mechanisms and limits of selection; marketing for engagement; media studies and anthropology for commodification and social consequence.

The framework in Section 5 was constructed by identifying the causal claim each body of work makes, arranging those claims into a common sequence and locating the points at which they connect. Readers should treat the result as one defensible synthesis rather than the only one available. A different selection of sources would yield a related but not identical structure and Section 9 returns to this limitation.

CONCEPTUAL FOUNDATIONS

1) **Attention scarcity in economic thought:** The economic treatment of attention rests on an asymmetry between supply and reception. Information supply can expand substantially at declining marginal cost; the capacity to receive it cannot expand correspondingly. Simon (1971) drew the consequence: in an information-rich environment, attention becomes the binding constraint and the design problem shifts from producing information to allocating the capacity that consumes it.

Goldhaber (1997) argued that this constraint would organise economic life on the internet. Davenport and Beck (2001) translated the argument for management audiences. Falkinger (2007, 2008) supplied the formal apparatus, as described in Section 1. Pedersen et al. (2021) situate the

same phenomenon within a broader political economy, arguing that attention is contested socially and institutionally rather than allocated purely individually and that its distribution reflects existing structures of power and access.

- 2) **Cognitive limits and rational inattention:** The economic argument depends on a claim about cognition: that individuals cannot process everything available and must select. Sims (2003) formalises this within economics through rational inattention, modelling the decision maker as operating under a finite information-processing capacity analogous to a communication channel. Agents choose not only what to do but how much to attend to and the cost of processing shapes observed behaviour in ways standard rational-choice models do not predict.

Loewenstein and Wojtowicz (2025) provide the current synthesis of the psychological and economic literatures. They treat attention as a productive input into search, belief updating and most other economic behaviour* and identify the motivational states that direct it, including curiosity and boredom. They also name attentional externalities produced by digital technology as a priority for research and raise the question of how artificial intelligence will alter the competition for attention.

The implication for this paper is that attention allocation is not fully deliberate. Novelty, emotional intensity, social feedback, uncertainty and reward structure all influence where attention goes. The commercial value of attention therefore depends partly on mechanisms operating below conscious choice, which makes the design of digital environments an economic variable rather than a purely technical one.

- 3) **The cognitive objection and the boundary of the resource framing:** The resource framing adopted here faces a direct challenge that should be addressed rather than assumed away.

Bruineberg (2025) argues that Simon's formulation depends on two assumptions contemporary attention research does not support: that attention is distributed by a central allocator and that it is a unified, invariant resource required for any cognitively demanding task. Neuroscientific and philosophical work instead describes attention as emerging from competition among concurrent perceptual and action-selection processes, with no single allocating mechanism and no stable common currency. Bruineberg (2023) develops a complementary argument, contending that information abundance alone cannot explain digital distraction and reframing the problem through active inference as adversarial: recommendation systems build predictive models of the user and act to sustain engagement, so where the system's objective diverges from the user's, the interaction becomes adversarial inference rather than overload.

This paper accepts the cognitive claim and narrows its own accordingly. Attention is treated as an economic resource at the level of observable aggregate behaviour, not as a claim about cognitive architecture. What firms compete for, measure, price and monetise is not an internal allocation mechanism but the observable distribution of time and interaction across competing sources, aggregated across populations. That distribution is bounded, contested, measurable and convertible into revenue whether or not a central allocator produces it.

Bruineberg's critique therefore functions as a boundary condition rather than a refutation. It rules out inference from market-level attention data to individual cognitive states and it warns against treating engagement metrics as measures of subjective attention. Section 4 observes that boundary

in defining the framework's terms. The adversarial inference argument is also incorporated positively, supplying the mechanism underlying Stage 2 of the framework in Section 5.3.

- 4) **From attention to engagement and commodification:** Attention and engagement are frequently conflated and the distinction matters here. Brodie et al. (2011) define customer engagement as a psychological state arising from interactive experiences with a focal agent, with cognitive, emotional and behavioural dimensions and distinguish it conceptually from involvement and participation. Hollebeek et al. (2014) develop and validate a measurement scale in a social media context, establishing that engagement is empirically separable from exposure and that its behavioural dimension is observable through interaction rather than presence.

The commercial consequence follows from that separability. Attention that does not develop into interaction produces little observable behaviour and therefore little exploitable information. Interaction, in the behavioural sense specified by Hollebeek et al. (2014), produces clicks, dwell time, sharing, purchasing and content creation, each recordable and each supporting prediction.

Ørmen and Gregersen (2023) document the resulting shift, showing YouTube commodifying content, audiences and creative labour together by cultivating commercial interaction, standardising exchange mechanisms and constructing systems of trust. Webster (2014) provides the complementary account of how audiences form and re-form under algorithmic conditions. Heitmayer (2025) extends the currency framing to peer-to-peer exchange, where attention circulates between users independently of any advertiser. Taken together, this work indicates that attention is better understood as the entry point to a commercial sequence than as the commodity finally sold.

DEFINITIONS AND PROPERTIES

- a) **Terms used in this paper:** The word attention carries several meanings in the literatures drawn on here and conflating them weakens the argument. Table 1 states the sense in which each term is used throughout.

Table 1: Terms and their use in this paper

Term	Sense used here
Attention (cognitive)	The selective orientation of cognitive resources toward a stimulus. A psychological construct. Not directly observable and not the object of the economic argument.
Behaviourally observed attention allocation	The observable distribution of time and interaction across competing sources, inferred from behavioural traces and used as an aggregate proxy for attention. The object of the economic argument. Abbreviated below and in the body of the paper as observed attention.

Term	Sense used here
Time spent	A partial and imperfect proxy for behaviourally observed attention allocation and the basis of its opportunity cost. Time spent is not equivalent to attention: a device may be open and unattended and attention may be divided across concurrent activities.
Engagement	A psychological state arising from interactive experience, with cognitive, emotional and behavioural dimensions (Brodie et al., 2011). Its behavioural dimension is observable; the others are measured by instrument (Hollebeek et al., 2014).
Platform metrics	Recorded behavioural traces such as impressions, dwell time, completion rate and return frequency. Proxies for behaviourally observed attention allocation and behavioural engagement, not measures of the cognitive construct.
Attention as an economic resource	Behaviourally observed attention allocation considered under the five properties

The distinction between time and attention deserves emphasis because the economic literature frequently relies on time-based measurement. Brynjolfsson et al. (2023) value the time consumers devote to free digital goods; they do not claim to measure attention psychologically. Their contribution is best read as establishing the opportunity cost of the time attention occupies, which is an important component of the economic argument without being identical to it.

b) **Five properties:** Five properties qualify observed attention as an economic resource. Each is stated at the level of observable behaviour.

- **Scarcity:** Aggregate observed attention is bounded by the available time of a population and by limits on simultaneous processing. Increases in content supply do not increase the total available.
- **Competitive constraint:** Attention allocated to one source may reduce the time and cognitive resources available to competing sources within the same interval. The relationship is a competitive constraint rather than a strict zero-sum one, since attention can be divided, switched rapidly, or given passively while another activity proceeds. Falkinger (2007) models the constraint formally.
- **Responsiveness of allocation:** The observed distribution of attention shifts in response to design, novelty, social influence and perceived relevance. this denotes the responsiveness of

an observed distribution to environmental change, not the operation of an internal allocating mechanism. It is the observed distribution that firms optimise against.

- **Measurability:** Digital environments record behavioural proxies: impressions, dwell time, scroll depth, completion rate, session length, return frequency. These proxies are imperfect. They are sufficient to allow platforms and advertisers to estimate, price and monetise access to audiences and engagement. Measurability is an enabling condition for commercial exchange rather than a source of value in itself.
- **Convertibility:** Observed attention can be converted into revenue through advertising, transactions, subscriptions, sponsorship and the predictive value of the behavioural record it generates. Convertibility distinguishes attention as an economic resource from attention as a psychological capacity.

c) **Properties and stages distinguished:** The framework uses several terms that also appear among the properties above and the relationship between the two should be stated explicitly to avoid confusion.

The properties explain why attention qualifies as an economic resource. They are static characteristics that hold at any moment and are established by argument from the literature.

The stages explain how that resource generates economic value. They are positions in a causal sequence, each with identifiable mechanisms and observable outputs.

Scarcity therefore appears twice, in different roles. As a property, it states that observed attention is bounded. As Stage 1, it identifies the point in the sequence at which that boundedness becomes economically binding, which Falkinger (2008) locates at the exhaustion of spare capacity rather than at the mere existence of a limit. The same holds for allocation and convertibility.

THE INTEGRATIVE FRAMEWORK

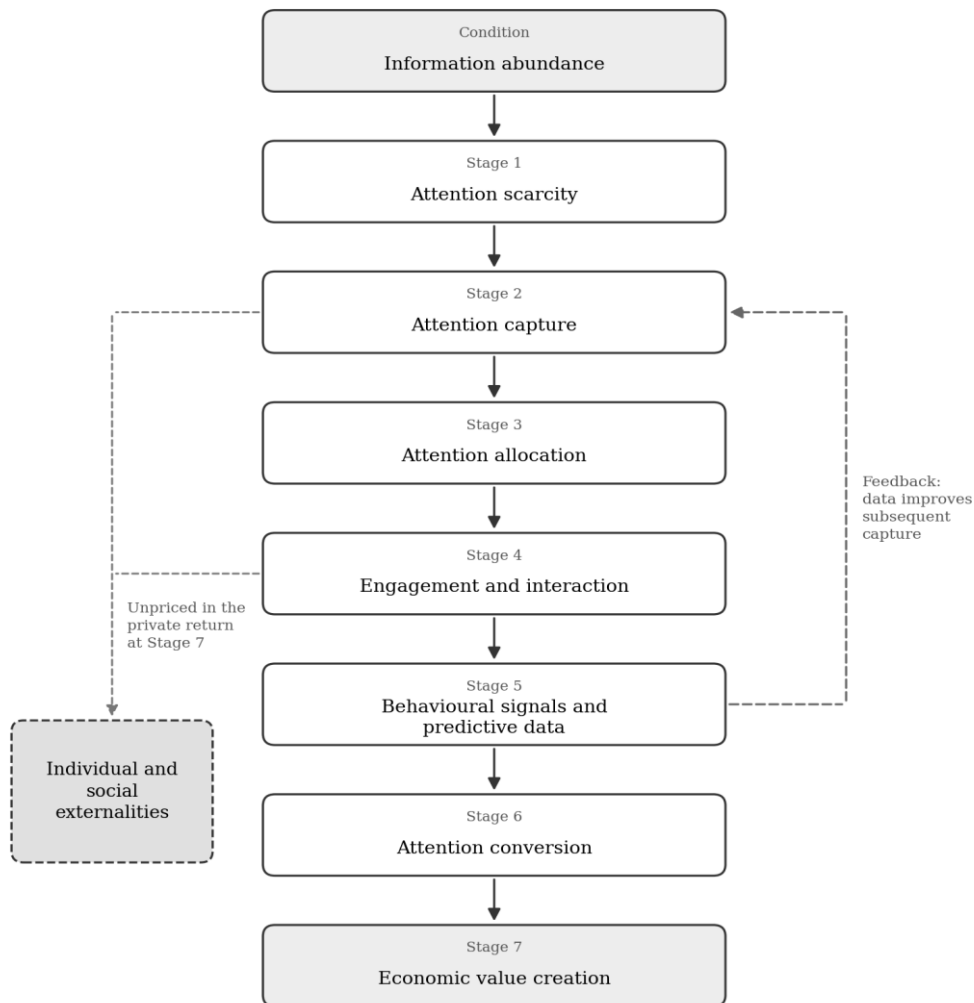
A. Structure

The framework specifies seven stages linking information abundance to economic value, one feedback loop and one parallel pathway. Figure 1 presents it graphically and the same seven stages are used throughout the paper.

The sequence is cyclical rather than linear. Behavioural signals generated at Stage 5 improve capture at Stage 2 for subsequent interactions, so the framework describes a self-reinforcing process rather than a one-directional chain. This feedback is the structural feature that distinguishes algorithmic attention markets from the broadcast attention markets Wu (2016) describes historically and it offers an explanation for why platform advantage may compound.

The stages are also sequential in logic rather than strictly in time. A single interaction may compress Stages 2 through 6 into seconds.

Figure 1: Integrative conceptual framework of attention as an economic resource



Note. Solid arrows indicate the primary value-creation sequence. The dashed loop on the right indicates feedback from behavioural data to subsequent capture. The dashed branch on the left indicates externalities arising at capture and engagement that are not reflected in the private return calculated at Stage 7.

Stage 1: attention scarcity: The framework begins from the imbalance Simon (1971) identified. Content supply expands; aggregate observed attention does not. The economic consequence is intensified competition among producers for a bounded receiver capacity. Falkinger (2008) locates the threshold precisely: competition changes equilibrium outcomes once spare capacity is exhausted, not merely because a limit exists. Attention becomes economically binding at that point rather than in principle.

Stage 2: attention capture: Competition drives investment in capture. The mechanisms are documented across several literatures. González de la Torre et al. (2026) describe the combination of behavioural design with large-scale analytics as a self-reinforcing cycle in which capture generates data and data improves capture. Ørmen and Gregersen (2023) document the platform-level standardisation of these mechanisms. Webster (2014) analyses algorithmic ranking and recommendation as instruments of audience formation. Bhargava and Velasquez (2021) examine

the design features associated with compulsive use, including variable reward schedules and infinite feeds. Heitmayer (2025) adds the social dimension, treating peer feedback as an attention-attracting mechanism operating independently of the platform's own promotion.

Bruineberg (2023) explains why these mechanisms are more effective than information abundance alone would predict. The recommendation system maintains a predictive model of the user and acts to bring observed behaviour closer to its own objective. Where that objective diverges from the user's, the system is not merely presenting options but operating against the user's stated preferences using a model the user cannot inspect. This is where the externality pathway branches from the main sequence.

Stage 3: attention allocation: Captured attention is either sustained or redirected. The observed distribution responds to perceived relevance, cognitive effort required, curiosity, emotional intensity, social influence, personal goals and interface design. This stage connects the economic and psychological literatures and the qualification applies most directly here: the framework models the distribution, not the mechanism producing it.

Stage 4: engagement and interaction: Attention can become commercially useful when it develops into engagement in the sense Brodie et al. (2011) specify. The relationship is conditional rather than automatic. A user may see an advertisement, ignore it and leave, generating exposure without interaction. The sequence at this stage is therefore attention plus interaction rather than attention alone and interaction is what the next stage records.

Stage 5: behavioural signals and predictive data: Interaction produces observable signals: viewing history, search patterns, interaction sequences, expressed preferences, social connections and responsiveness to particular recommendations. Aggregated, these signals acquire predictive value.

This stage carries an important economic implication. Predictive data extends the value of attention beyond the moment of exposure. An advertisement viewed once has value at that moment; the behavioural record it generates may retain value across subsequent interactions. Attention reaching Stage 5 can therefore produce both a current return and a potential for future returns. The size and durability of that potential will vary with the quality of the signal, the stability of the user's preferences and the rate at which the record decays, none of which the framework specifies. This stage closes the feedback loop shown in Figure 1.

Stage 6: attention conversion: Conversion mechanisms differ in structure and in the attention characteristics they reward.

- Advertising aggregates audiences and sells access, rewarding reach and targeting precision.
- Commerce converts attention into transactions, rewarding purchase intent over duration. This pathway is particularly relevant to social commerce, livestream retail and creator-led selling.
- Subscription converts sustained perceived value into direct payment, rewarding retention and making the user the payer rather than the product.
- Creator monetisation distributes conversion across sponsorship, affiliate arrangements, merchandise and platform revenue sharing, making individuals competitors for attention in their own right (Ørmen & Gregersen, 2023).

- Data-driven services convert behavioural signals into improved targeting, recommendation and prediction, generating indirect rather than direct return.

A single platform typically operates several of these simultaneously, which is why treating attention monetisation as synonymous with advertising understates the economics of contemporary platforms.

Stage 7: value creation and the parallel pathway: Conversion produces platform revenue, creator income, market power and consumer surplus. Brynjolfsson et al. (2023) demonstrate that the consumer surplus component is substantial and that conventional measurement misses most of it.

The parallel pathway records what the private return calculation omits. Loewenstein and Wojtowicz (2025) identify attentional externalities as an emerging priority in economics. These include distraction and cognitive overload, dependency, the circulation of misinformation, reduced autonomy and downstream political and social costs. Hendriks Vettehen and Schaap (2023) trace these effects across media consumption, information quality and public health and argue that they belong within the policy frame rather than being treated as individual-level problems. Bhargava and Velasquez (2021) analyse the ethical structure of these harms, arguing that design choices producing compulsive use raise questions of corporate responsibility distinct from questions of consumer choice. Hansen (2024) argues that generative artificial intelligence may extend the pattern beyond attention capture into what he terms cognitive lock-in, in which users develop computational dependencies that make substitution costly.

Ryan et al. (2020) provide a direct illustration. Analysing a large sample of online articles on a contested scientific topic, they found that a small group of alternative health and conspiracy-oriented sites attracted greater total social media engagement than conventional media outlets. Attention-based monetisation can therefore reward content because it is engaging, independently of whether it is accurate. The authors were employed by a firm with a commercial interest in the subject matter, so the finding is used here for its structural implication rather than for its substantive conclusions.

Belgroun et al. (2025) treat such effects as a market failure and propose a Pigouvian tax on attention capture as a corrective instrument. This is their proposal rather than an established policy and Section 8.3 treats it as one option among several.

PROPOSITIONS

Five propositions follow from the framework. Each addresses a distinct element: attention quality, engagement as mediator, convertibility, the monetisation model and externalities.

- **Proposition 1.** *Attention that is sustained, contextually relevant to the monetisation mechanism and behaviourally informative is likely to convert into economic value at a higher rate than attention that is brief, contextually unrelated, or passive.*

This proposition concerns attention quality. Measurability is treated as an enabling condition rather than a component of value, since a signal may be recorded precisely and remain economically worthless. Testing requires dwell-time, relevance and interaction-depth measures against conversion outcomes, holding reach constant.

- **Proposition 2.** *Engagement mediates the relationship between captured attention and economic value creation.*

Attention is proposed as an important but not sufficient condition. The mediation can be tested using the validated engagement scale of Hollebeek et al. (2014) as the mediating construct between exposure measures and commercial outcomes, with attention quantity as the independent variable.

- **Proposition 3.** *The economic value realised from a given volume of attention varies with its convertibility under the business model in operation.*

Where Proposition 1 concerns the character of attention, this proposition concerns the fit between that character and the conversion mechanism. It predicts that identical attention profiles yield different returns across models and it is testable by holding the audience constant and varying the monetisation mechanism.

- **Proposition 4.** *A platform's dominant monetisation model shapes which attention characteristics it optimises for and this is observable in its design and recommendation behaviour.*

Advertising-based platforms are expected to place greater emphasis on duration and reach, commerce-based platforms on purchase intent and subscription-based platforms on retention. The prediction is directly observable through interface analysis and recommendation auditing across platform types.

- **Proposition 5.** *Attention capture strategies that maximise short-term engagement are likely to generate externalities not reflected in the platform's private return, producing divergence between private and social value.*

This is the framework's welfare claim and the basis of the parallel pathway in Figure 1. It can be examined by comparing engagement-maximising design changes against measures of user wellbeing, information quality, or subsequent disengagement and it underpins the policy.

CONTRIBUTIONS

- **An explicit account of disciplinary integration:** The title of this paper claims integration and Table 2 states what each discipline contributes and where it attaches to the framework.

Table 2 :Disciplinary contributions to the framework

Discipline	Contribution
Economics	Scarcity, competition for receiver capacity, allocation, welfare and efficiency
Cognitive science and philosophy of mind	Mechanisms and limits of selection; the boundary of the resource framing; adversarial prediction

Discipline	Contribution
Marketing	Engagement as a distinct construct; measurement of behavioural engagement
Information systems	Algorithms, recommendation, behavioural measurement, valuation of free goods
Management	Business models and the pathways through which value is realised
Media studies and anthropology	Commodification of content, audiences and creative labour; political economy of attention
Ethics and policy	Externalities, autonomy, corporate responsibility, regulatory instruments

The integration is structural rather than a summary of positions: each discipline supplies the explanation for a specific stage and the framework specifies how those stages connect.

- **Attention as an input rather than a commodity:** The advertising-centred account treats attention as the good that is sold. The framework treats it as the input that activates a longer sequence in which interaction, data and transaction each add value. The two accounts predict different platform behaviour. Under the commodity account, a platform maximises exposure. Under the input account, it maximises the informational yield of exposure, which can mean showing less content rather than more. Which account better describes observed platform behaviour is an empirical question this paper does not settle. The framework's contribution here is to make the two accounts distinguishable and therefore testable.
- **A defensible resource framing:** It is addressed rather than avoided the principal objection to treating attention as a resource. The resulting framing is narrower than the standard one and more robust for that reason. It supports claims about market-level attention distribution and its conversion into value and it explicitly does not support inference from engagement metrics to individual cognitive states. Stating this boundary is itself a contribution, since applied work in the area frequently crosses it without acknowledgement.
- **Private value and social cost in one structure:** Accounts of the attention economy tend to divide between those analysing value creation and those analysing harm. The framework holds both and locates an important point of connection between them at Stage 2. The same capture mechanisms that generate consumer surplus are likely to generate the externalities on the parallel pathway. Treating them as separate phenomena obscures that they follow from one set of design decisions.

IMPLICATIONS

- ✓ **For management:** Attention should be treated as a resource constraint in planning rather than as an outcome to be maximised. Customers, employees and investors all operate under it and internal communication systems designed on the assumption that more information reaches more people may produce the opposite effect.

Measurement should shift from quantity toward quality and convertibility. Impressions and reach remain the default metrics in most reporting because they are inexpensive to collect rather than because they predict value. If Propositions 1 and 3 hold, reach is a weak proxy for value and organisations that optimise against it may misallocate marketing expenditure accordingly.

Capture strategies may carry a delayed cost. Design choices that maximise short-term engagement at the expense of user experience can raise measured performance in the current period while increasing churn later. Where the two effects fall in different reporting periods, standard performance measurement will favour the strategy that destroys value.

- ✓ **For consumers:** The framework identifies the exchange embedded in zero-price services. Users provide time, attention and behavioural information; they receive access, convenience, entertainment, information and social connection. The exchange is genuine and, on the evidence of Brynjolfsson et al. (2023), often favourable in aggregate. It is nonetheless opaque and its terms are set unilaterally. Digital literacy should therefore extend beyond privacy in the narrow sense to the mechanics of Stage 5: what behaviour is recorded and what it is used to predict.
- ✓ **For policy:** Regulation built around price and expenditure has limited purchase on markets where the price is zero. The framework identifies three points of possible intervention within one causal sequence.
 - **Stage 2**, through rules on manipulative interface design, default settings and notification practice.
 - **Stage 5**, through transparency requirements covering what behavioural data is collected and what inferences are drawn from it.
 - **Stage 7**, through instruments that internalise the externalities on the parallel pathway. Belgroun et al. (2025) develop the case for a Pigouvian tax on attention capture as one such proposal.

The choice among these is a policy judgement rather than a theoretical one. The framework's contribution is to show that they intervene at different points in the same sequence and therefore carry different distributional consequences.

LIMITATIONS AND FUTURE RESEARCH

The framework is conceptual and untested. The five propositions specify constructs and suggest designs, but none is examined empirically here.

Measurement is the most serious constraint. Every available proxy records behaviour rather than attention itself and dwell time does not distinguish sustained attention from an unattended open tab. This is more than a practical difficulty, since it is conceded that the framework operates at the level of observed distribution rather than cognitive state. Developing measures that separate attention quality from duration would be the most valuable methodological contribution available to the field.

The synthesis is selective. It is stated that this is a conceptual paper rather than a systematic review and a different selection of sources would yield a related but not identical structure.

The framework also concentrates on commercial digital environments. Attention operates under different institutional conditions in education, workplaces, political communication and non-digital media and the conversion stage in particular may not transfer. Platform monetisation additionally changes faster than theory, so the framework should be read as specifying a structure of stages rather than a fixed inventory of conversion methods.

Six research directions follow:

- **Valuation:** Estimating the economic value of attention by quality class rather than by volume, extending the time-based approach of Brynjolfsson et al. (2023) while observing the distinction between time and attention set out in Table 1.
- **Attention quality measurement:** Constructing and validating measures that distinguish passive, active, sustained, fragmented and high-intent attention.
- **Cross-model comparison:** Testing Proposition 4 by comparing design and recommendation behaviour across advertising, subscription, commerce and creator-oriented platforms.
- **Welfare:** Examining whether increases in attention consumption raise or reduce consumer welfare and over what horizon, which bears directly on Proposition 5.
- **The feedback loop:** Estimating the strength of the Stage 5 to Stage 2 return path, which the framework asserts but does not quantify and which determines how rapidly platform advantage compounds.
- **Generative artificial intelligence:** Examining the tension between AI expanding information supply, intensifying scarcity and improving filtering, potentially relieving it. Hansen (2024) suggests the more consequential effect may be neither and may involve new forms of dependency instead.

CONCLUSION

Attention has long been understood as a cognitive capacity. The growth of information-intensive digital environments has made it an economic one as well, not because its psychological nature has changed but because it has become scarce relative to what competes for it, measurable at scale and convertible into revenue.

This paper has argued that observed attention functions as an economic resource in virtue of five properties and has specified the sequence through which it becomes economically valuable: scarcity, capture, allocation, engagement, behavioural signals, conversion and value creation. The sequence is cyclical, with behavioural data returning to improve capture and it is accompanied by a parallel pathway recording externalities the private return does not price.

The framing adopted here is deliberately narrow. It treats attention as an economic resource at the level of observable aggregate behaviour and does not claim that attention is a unified cognitive resource allocated by a central mechanism. Recent work in cognitive science makes the stronger claim difficult to sustain. The narrower claim is sufficient for the economic argument and more defensible for it.

The framework proposes that economic value depends more strongly on attention quality and convertibility than on attention volume alone. If that proposition survives testing, it has consequences for how firms measure marketing performance, how platforms are valued and where regulation should intervene. Examining it is the most direct extension of this work.

Attention is unusual among economic resources in that it is also a component of autonomy, learning and relationship. What is economically valuable to a platform and what is valuable to the person supplying the attention need not coincide. The framework does not resolve that tension. It locates it, at Stage 2, where capture begins.

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