

ATTENTION ECONOMY IN THE DIGITAL AGE

Foreword from AXE:

This document introduces and details such concepts and standards that we as AXE Technologies will hold ourselves accountable to. It states the guiding principles and philosophy we believe are necessary for the operators in the industry to abide by in order to fulfil the 3 fundamental requirements for a sustainable and functional environment:

AXE manifesto

- DATA SOVEREIGNTY - users' control over one's own identity
- DIGITAL DEMOCRACY - objective and fair access to content
- ATTENTION VALUE - the right to make independent decisions over one's own attention while being rewarded for it

The document highlights some challenges and opportunities the industry is facing and how we plan to resolve them. The industry we are talking about here is digital media, which includes publishing, advertising, streaming, content creation and more. The key stakeholders are:

- 1) **publishers** – those who create content and make it available for consumption
- 2) **advertisers** – those who try to gain the attention of their target audiences via either paid, owned and/or earned marketing communications
- 3) **users** – those who consume content and are the target of marketing communications
- 4) **technology providers** – those who provide technology solutions and tools for the above 3 stakeholder groups

INTRODUCTION

In the era of infinite stimuli and information sources, physical presence doesn't guarantee the quality of interactions and human engagement. In order to make one's presence meaningful, the mind needs to be present. For the mind to be present, it needs to be valued.

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As more and more brands, products and services are vying for our attention, it has become a hot commodity. But what exactly is attention? How does it work? And how can one build a full-fledged economy around it?

Wikipedia defines attention like this:

"Attention is the behavioral and cognitive process of selectively concentrating on a discrete aspect of information, whether considered subjective or objective, while ignoring other perceivable information. It is a state of arousal."

Marriam-Webster defines attention like this:

"The act or state of applying the mind to something."

What does that mean?

First, in order to determine what attention is, we need to understand some of the key characteristics/attributes of it.

- Non-linear, can bounce between subjects in a non-predefined manner
- Correlates with how alert the individual is (Circadian rhythm, fatigue etc.)
- "Cocktail party" effect, familiarity of the subject heightens attention
- Finite, we have only a limited amount available per day
- Is impacted by the clutter surrounding the individual
- Can be conditioned
- Volatile, can shift back and forth in rapid succession
- Driven by emotional state

The above suggests that there are close to infinite number of combinations of how attention can manifest itself. Then why do so many companies and projects define attention as time spent, pages visited, items clicked, content shown or some other simple metric? Such oversimplification happens primarily for three reasons.

First, it is exceedingly difficult to measure and evaluate someone's attention with the existing technologies available.

Second, fully understanding human psychology is not trivial in real life, let alone in the digital world.

Third, "measuring attention" is an industry adopted requirement for any company operating in the attention economy to be taken seriously and being able to get paid for their products and services. Whether they can actually do it or not, is unfortunately sometimes secondary.

Let's dig a little deeper into each of the above reasons to understand them better.

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MEASURING ATTENTION

Attention is a complex area which involves an understanding of psychology and physiology. In other words, understanding how the brain works is crucial. With the technology that is available at this day and age, it is practically impossible to measure anyone's attention accurately in the digital world. However, it is possible to do it well enough to serve a purpose other than just as a marketing gimmick.

TECHNICAL ASPECTS OF MEASURING ATTENTION

The technical side of measuring attention can be divided into 4 levels; 1) Behavioral, 2) Contextual, 3) Attitudinal, and 4) Mental. Each of these levels has its own set of metrics that can be used for the measurements.

MEASUREMENT LEVEL	DATA SETS / TARGETING	SHARE %	WHO
BEHAVIORAL	3rd party behavioral data for demographic targeting	75%	Most adservers and ad networks.
CONTEXTUAL	1st party contextual data for contextual targeting	20%	Most publishers.
ATTITUDINAL	Omni-channel interest data for psychographic targeting	4.5%	Big data companies, progressive media conglomerates and cutting-edge tech companies.
MENTAL	Comprehension and focal data for creating personalized experiences	0.5%	Pioneering technology companies.

METRICS USED PER MEASUREMENT LEVEL:

BEHAVIORAL metrics = Visits, Clicks, Page views, Time spent, Impressions etc.

CONTEXTUAL metrics = User profiles, Content consumption etc.

ATTITUDINAL metrics = User interest, Social connections, Lifestyle, Sentiment etc.

MENTAL metrics = Emotional state, Message comprehension, Focus, Clutter etc.

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EXAMPLE SCENARIO:

Here is an example on how the different levels of measurement allow services to customize their users' online experiences. Most companies claim they can do full customization, but this is what reality looks like:

SCENARIO: Advertising, user looking to go on a holiday

BEHAVIORAL = after visiting a travel related website, you'll be shown hundreds of travel related ads even after you've already returned from your trip.

CONTEXTUAL = user has registered to a website and during the process selected being interested in a specific category of travel (e.g. skiing). By using the registration data, the media can target the user with skiing related ads within their property. Whether the user is thinking about a skiing trip at the time the ads are shown, is a crapshoot.

ATTITUDINAL = user has indicated an interest in going on holiday by searching, sharing and commenting on information related to traveling on multiple websites/apps. The user's activity and sentiment has been positive towards travel. As a result, they can be targeted with relevant ads in relevant media contexts.

MENTAL = by understanding what triggers the user to take action and at what time, the ad placements and contents can be tailored to match the user's needs. This is likely to result in higher conversion rates and the users feel it as a positive experience.

PSYCHOLOGY BEHIND ATTENTION

When people pay attention to various encounters in their lives, there are a lot of things that happen in our minds and bodies. This is true both on a mental as well as physiological level. On a mental level, we as humans tend to pay more attention to subjects and events that are either familiar, prominent, interesting, recent and/or rewarding to us. On a physiological level, our bodies and brains produce a mixture of chemicals (e.g. serotonin, endorphin, adrenaline, adenosine, dopamine etc.) that encourage us to either continue or stop doing what we're doing based on how they make us feel.

For example, if you read the news about an incident that happens on the other side of the world, you probably won't pay too much attention to it nor remember it for much longer. But if it happens to be that your close relative is traveling at that

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particular part of the world, all of a sudden, you will start paying a lot more attention to what was said and written in the news.

This phenomenon happens because when your emotional state is heightened, your brain starts producing and releasing more of the aforementioned chemicals leading into your mind focusing and paying more attention to the content you're consuming.

"The velocity of your emotions defines your attention."

This scientific phenomenon can be either exploited or used as a service.

BIASES AND DOPAMINE MANIPULATING OUR ATTENTION

Confirmation bias is being ruthlessly used to direct our attention. Machine learning models for example are particularly good at exploiting confirmation bias. Think of Youtube's recommendation algorithm for a moment.

Here's what the Chief Product Officer, Neil Mohan, of Youtube said about the algorithm. He used face masks as an example:

"This is coming from an authoritative channel, a news source, a medical professional, and if that's the case, we think there's going to be some context that's provided around the question of masks. And even if that guidance changes, it will be reflected in sort of how an authoritative voice or channel talks about it."

Mohan then made it clear how non-mainstream channels are algorithmically shadow banned by "removing or reducing views of the videos where that same level of authority hasn't been established."

<https://summit.news/2020/05/05/youtubes-chief-product-officer-insults-his-own-users-as-basement-dwelling-idiots/>

In other words, the above-mentioned algorithms are not used to democratically deliver content to you, but to feed your confirmation bias and/or generate a dopamine rush, which keeps your attention with them for longer. This of course is done to maximize the time users spend on their properties, which in turn can be sold for more advertising dollars.

The issue herein lies in the fact that every media is trying to do the same. By increasing the quantity, a user spends with the media has its limits, though. There are a finite number of hours a user has available to them per day. But the same holds true for another extremely valuable commodity as well – attention.

Therefore, if increasing the quantity of time spent or times viewed only delivers diminishing returns, what could be an alternative solution?

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What if we could increase the quality instead of the quantity of said media encounters? Think about a workplace for example. Conventional wisdom may state that the more hours an employee puts into their work, the higher the output.

However, this has been proven not to be the case (<https://hbr.org/2015/08/the-research-is-clear-long-hours-backfire-for-people-and-for-companies>, *The Research Is Clear: Long Hours Backfire for People and for Companies*, Harvard Business Review). The same applies to media consumption, attention as well as message comprehension and recall.

The industry needs to recalibrate its ethos in order to come up with solutions that serve its own sustainability and long-term purpose.

INDUSTRY EXPECTATIONS

If you were to start any digital advertising related business today and not claim you can “do attention”, it would be difficult to become successful. Attention has become this hygiene factor in evaluating technology providers, marketing platforms, publishers etc. in the digital world. However, nobody has created a standard around how to “do it”. In other words, anyone’s interpretation of the term ‘attention’ seems to be good, as long as they can verbally make it sound convincing enough.

This has to change.

The industry must come to a common understanding of how attention plays a role in marketing models, what the so-called attention standards should be and how they are incorporated into the business itself.

ROLE OF ATTENTION IN THE AIDA MODEL

Let’s take a look at one of the fundamental models in marketing – AIDA (Awareness, Interest, Desire, Action). What kind of role does attention play in it?

The AIDA model aims to identify where consumers are within a behavioral process at any given time. It is a hierarchical model which the consumers move through stage by stage (A to I to D to A). The model is most often used in sales and marketing in mapping purchase paths and communication strategies.

If we break each of the stages down to their basic formulas, we quickly realize how important attention is throughout the whole model:

AWARENESS

In order to make someone aware of anything new, they must see/hear about the subject often enough and to understand the message delivered to them.

= *Reach + Frequency + Attention*

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INTEREST

In order to make that person interested in the subject, they need to either view it in a positive light or see a value in it and internalize how that would relate to them personally.

= *Sentiment + Association + Attention*

DESIRE

In order to make that person want to acquire the subject, it would need to be acceptable based on social norms and provide a perceived benefit to the person.

= *Values + Attraction + Attention*

ACTION

If the person forms a strong enough need/want towards the subject and has the required resources for the acquisition, they will figure out a way for themselves to complete the transaction and do it.

= *Trigger + Means + Attention*

It is only logical that attention plays a major role in all the stages of a person's path to purchase, since it is difficult to make decisions without paying attention to the subject at hand.

We know attention is important, so let's now look at how it can be measured.

ATTENTION MEASUREMENT FRAMEWORK

Here is a snapshot to how we are developing our attention measurement capabilities. In order to determine the level of attention a user pays towards content and messaging in the context of digital advertising, we use the following formula:

$$\left[\frac{\log(\text{State}_0 + \text{State}_1)}{\text{State}_n} \right] + \left[1 - \frac{\{\text{Time}_O - \text{Time}_A\}}{\text{Time}_O} \right] + \frac{\text{Familiarity}_{O...5}^*}{\text{Proximity}^2} + \frac{\text{Attention}_U}{\text{Attention}_A} + \frac{\text{Area}_{FP}}{\text{Area}_T * \text{Impact}_T} +$$
$$\text{Media}_C + \frac{\overrightarrow{\text{Input}_T} * \overrightarrow{\text{Activity}_T}}{\overrightarrow{\text{Media}_T}} + \text{BrainWave}_E + \text{BrainPower}_R + \text{Profile}_V * \text{Activity}_O$$
$$= \frac{\text{Attention value (\$)}}{\frac{\text{Value}_{\text{Max}}}{\text{Value}_{\text{Min}}}}$$

$\text{Value}_{\text{Max}} = \text{Value ceiling (advertiser set)}$
 $\text{Value}_{\text{Min}} = \text{Value floor (publisher set)}$

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State => Progression of attention is non-linear, so we try to estimate the current state of user's attention at any given time.

Time => We measure the user's reaction time to content triggers and interactions and compute how it compares to optimal reaction times.

Familiarity => We compute correlation between the mental proximity of content consumed and its familiarity to the user.

Attention quota => Attention is a finite resource. We take an estimation of the available attention quota into account when determining how much attention a user may pay towards content.

Clutter => The more information a user is faced with at any given time the less they can pay attention to each of those pieces of information.

Conditioning => We estimate the impact of potential guidance, directions and rewards a media communicates to the user verbally or non-verbally.

Volatility => Attention is very volatile and may change rapidly. We take into account the type of activity, media and input the user is exposed to.

Brainwave => Different contents and contexts trigger different brainwaves in humans. We estimate how each user's emotional state impacts their attention.

BrainPower => A human brain has a limit of how much information it can process at any given time. We take this into account when determining the level of attention paid towards content.

Value => We calculate the value of the user's attention to the objective at hand.

We keep updating the above formula and its underlying benchmarks constantly and would welcome collaboration around the topic in the industry.

ATTENTION ECONOMY

Now that we have a better understanding of what attention is, the next question to answer is "how to create an economy around it". The good news is that there is no need to create an economy around attention – it already exists. The question to answer instead is "how should we define attention economy". Here's how Wikipedia does it:

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‘Attention economics is an approach to the management of information that treats human attention as a scarce commodity and applies economic theory to solve various information management problems. According to Matthew Crawford, “Attention is a resource—a person has only so much of it.”

In digital advertising attention economy currently manifests itself according to Wikipedia as such:

“Since the cost to transmit advertising to consumers has become sufficiently low given that more ads can be transmitted to a consumer (e.g. via online advertising) than the consumer can process, the consumer's attention becomes the scarce resource to be allocated. As such, a superfluidity of information may hinder the decision making of an individual who keeps searching and comparing products as long as it promises to provide more than it is using up.”

Summing up the above, we can safely conclude that the holy grail in defining attention economy is being able to assign a value to a user's attention.

ATTENTION AS A CURRENCY

Once a user's attention has a tangible value, it can be used as a medium of exchange – a currency.

The old adage goes “If you're not paying for the product, you are the product.” and that couldn't be more true on the Internet at this day and age.

At AXE we have been using attention in digital advertising as an alternative payment method for accessing digital content for years with great results. According to our findings users are over 10 times more likely to pay attention to the content and accompanying advertising when their attention is valued.

At the moment, attention is a perishable currency. In order to fully utilize it in a digital economy, we have to find a way to be able to store it. However, that poses another challenge that needs to be overcome first. Attribution of said currency to its rightful owner.

ANOTHER MAIN COMPONENT OF ATTENTION ECONOMY - IDENTITY

For attributing attention value to a user and allowing them to store accumulated value, there needs to be a tracking mechanism in place. With tracking, whether attention or anything else, comes a dilemma - user privacy. A user should have full control over their own identity both in the real and the digital world. Currently, that is not the case.

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"The Internet gave us access to everything. But it also gave everything access to us." – James Veitch

In our (users) daily digital encounters, we bounce between four levels of identity:

4 LEVELS OF IDENTITY:

- 1) TRUE - verified by a government body
- 2) PROFILE - credibility is established over time based on reputation within a community
- 3) PROJECTED - can be modified by the user to their liking at any point
- 4) ANONYMOUS - no identity is presented

The issue presents itself when we need to find a trustworthy entity to manage and validate our identities in various encounters. There are multiple projects out there who are trying to solve this dilemma - how to manage identities online. The main challenge is to come up with a new kind of governance system that enables international verification, validation, governance and trust. Something that doesn't exist in the physical world today.

At AXE we are working on a de-centralized solution, which would give users the tools to not only manage their online identities safely, but to validate their identities regardless of the use case. Think of it as a personal digital dashboard for your identity with an accompanying personal digital apostille.

There will be multiple ideas and concepts built using some of the philosophies and standards set forth in this document. We believe that any such solution should follow the AXE Credo aka 'S⁴ principle':

- Secure by design (*Is it possible for a bad actor to do harm with it?*)
- Sustainable (*Is the lifecycle of the product/feature longer than 12 months?*)
- Scalable (*Is it possible to roll out internationally for millions of users fast?*)
- Simple to use (*Is it easy for anyone to use?*)

ACTION POINTS

Join us on this journey to make digital life fair, democratic and sustainable for commerce, advertising and content by reaching out to us and highlighting how you could contribute to the future of all our digital lives.

By email: <mailto:support@axeprotocol.com>

Via web: <https://axeprotocol.com>