Case Study

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Brain Data and Immersive Environment: Privacy Law and Governance Issues

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Abstract: The immense possibility of the use of brain data in the context of immersive technology and environment is explored in this case. The scenario of how a new start-up working on brain data technology in an emerging economy like India and its regulatory and legal ecosystem-based challenges are highlighted. For brain-data start-ups, combining with immersive gaming gadgets offers promising growth opportunities. Business obstacles include limitations on neurowearables, patents on brain data technology, worries about cognitive privacy, and telecom rules on infrastructure beyond 5G are examined. Algorithmic responsibility and governance are also addressed in this context, along with requirements of separate regulations for the privacy of physical features and cognitive data and restrictions of the Genetic Information Non-Discrimination Act (GINA). Human rights abuses and scenarios involving the right to work owing to brain data are also assessed.

Introductory scenario:

Brain Data Analytics India LLP is a new start-up - venture formed by three scientists as co-founders. Objective of Brain Data Analytics India LLP is to tap the computer and brain interface and explore brain data and attempts to find commercial uses of the same. One of the concerns faced by the organisation is with respect to the possible regulatory restrictions as well as the legal and ethical challenges that may arise.

Government being concerned about the evolving regulatory paradigm is planning to appoints a committee as there is significant possibility of regulatory issues pertaining to fairness in the decision-making process being altered due to the chance of influencing. The need for prior informed consent and privacy issues in the context of brain data mapping is another relevant issue. The countries such as Chile have already enacted neuro rights related to the possible use

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of technology also needs to be understood as the background for regulatory churn. EU have pointed towards the use of Responsible AI and evolved principles of data protection.

Civil society organisations demand for ban of use of technology that would provide an immense advantage to the private commercial organsiations to influence human decision process. The possibility of neurodiscrimination, i.e., "discrimination based on a person's neural signatures" (Ienca et.al 2022) is also highlighted by the civil society groups. The question of how the social media and other platform business models have evolved without proper regulatory and ethical oversight forms a good example for many of the civil society organisations to raise concerns.

rview of technological advancement and issues of Brain Data and Immersive Environmental

The company has developed a high-level design for its brain-data management, which aids the organisation in identifying opportunities and detecting potential issues during the data sourcing, data extraction, data pre-processing, data analysis, and solution delivery.

Data Sourcing

Neurowearables devices and brain technology partnerships:

The Brain Data Analytics India LLP has contracted with numerous scan facilities in an effort to investigate different methods of gathering training brain data for its immersive analytic solutions. By entering into an agreement with brain scan facilities, the company is able to collect non-invasive brain imaging data using techniques like electroencephalography (EEG), magnetoencephalography (MEG), functional magnetic resonance imaging (fMRI), functional near-infrared spectroscopy (fNIRS), etc., as well as invasive techniques like positron emission tomography (PET). By acquiring brain data via scan networks, the company can reduce direct contacts with people or voluntary data providers, which saves time.

The company also plans to collect brain data from customer care departments of communication devices and tourist information desks, where it is particularly looking for psychographic data. The company intends to deploy a mobile application that provides voice assistant devices and rapid real-time access to client data.

Data Extraction

Integrating Immersive solutions with neuro-sensing devices:

By concentrating on the neuro-wearable device industry, the potential for rapid expansion is constrained since customer acceptability is mostly influenced by the treatment or health monitoring goals. Brain Data Analytics India LLP has begun investigating immersive

platforms as part of the business's strategic expansion plan. On these platforms, neuro-sensing devices are used for entertainment, and it should be reasonably simple to implement new brain technologies. The cost of immersive gaming solutions and the absence of a culture of computer-mediated gaming in many geolocations, however, may limit the quality and volume of data that the company can gather. Additionally, the limited availability of 5G and Beyond 5G (B5G) infrastructure, the high bandwidth requirements of immersive 3D gadgets, and the low internet penetration limit enterprises to closed groups or labs.

In addition to the infrastructural difficulties involved in extracting the necessary brain data from Meta-cloud storage or real-time streaming, the development of 5G, B5G, or 6G telecom infrastructure may be subject to new data protection and privacy rules. The market expectations of firms may be further hampered by regulations on neurosensing equipment used for non-medical purposes, developing laws governing cognitive privacy, and laws protecting brain data.

Data Pre-processing and Analysis

In contrast to physical data characteristics, brain data offers a vast array of opportunities for reidentifying the people and groups from which the data was collected. To remove reidentification elements from the collected data, the organisation has employed extreme data experts. The team has looked into brain data possibilities like national security concerns, patterns of brain activity in migrant workers, individuals' propensity for committing crimes, the ability of people with disabilities to sign legal documents, particularly in relation to adoption, the mental preparation for parenting, and the evaluation of children's cognitive ability by schools during the admissions process etc. In order to prevent potential cyberattacks or algorithmic attacks on the brain data that might take advantage of such possibilities, the team has developed checkpoints.

Data insight delivery

The company has incorporated neuro-insight service provision as integral part of their Corporate Social Responsibilities framework. Therefore, the company's neuro-solutions explicitly adhere to data protection laws like the General Data Protection Regulation (GDPR) and the Personal Data Protection Bill of many nations, as well as health care laws like the Health Insurance Portability and Accountability Act of 1996 (HIPAA) and the Genetic Information Non-Discrimination Act (GINA).

Legal and Ethical Issues that arises

The concept of information privacy leads has evolved over period of time due to the rapid advancement of technology. The concept of right to privacy, especially digital information privacy has gained legal status in most of the evolved jurisdictions across the world. In the Indian context, the Supreme Court of India have recognized the privacy right to be a fundamental right.[3]

Apart from ethical obligation of being fair and transparent in dealing with the consumers and its users, the digital platforms are increasingly under the scrutiny of legal and regulatory framework for privacy concerns. For example, Whatsapp had a long draw legal battle in India, regarding changes in the privacy policy.[4] The possibility of sharing data with its parent company, Facebook (now Meta) had irked the users and regulatory body. Is it enough to just mention the possibility of using data for monetisation, advertisement and algorithmic control over which content to expose the users etc. raises pertinent question of concern regarding ethical, fairness aspects?

Based on this regulatory background, the concept of brain data mapping takes these concerns one step ahead. Do you feel that the "cognitive monitoring, neurofeedback, device control or other forms of brain-computer interfacing" (Ienca et.al 2022) requires more pertinent regulations and intervention from the governmental agencies? Or can the self-regulatory approach would be appropriate with mechanisms similar to Facebook Oversight Board? The civil society organisations are raising these pertinent questions against the Brain Data Analytics India LLP and similar tech-based start-up organisations. The possibility of neuro-discrimination accentuates the requirement of effective corporate accountability, either through the self-regulatory or government mandated legislative route. Moreover, the question of digital human rights needs further strengthening as the need for balancing societal interest and corporate organisations are largely evident in the context of brain data mapping.

Have countries evolved regulations based on brain data-based concerns? Yes, Chile is an interesting example to analyse in this context. Constitutionally guaranteed rights were included in the Chilean constitution by the government as a means to streamline the concerns of brain-

[3] Justice K.S.Puttaswamy(Retd) vs Union Of India., Available at https://indiankanoon.org/doc/127517806/
[4] WhatsApp tricking India users into accepting its privacy policy: Govt, Available at https://economictimes.indiatimes.com/tech/technology/whatsapp-tricking-indian-users-into-accepting-its-privacy-policy-govt/articleshow/83198779.cms

computer interface (McCay 2022). As reflected from the concerns raised by the civil society organisations, it would be significant to contemplate similar legislative protection.

The changing social value surrounding the concept of privacy and autonomy of human decision making needs to be recognised by the business organisations. The increasing influence of digital media, platforms and technology could give rise to emerging need for new age digital rights to be recognised by the legal system. The need for responsible innovation and product development in the realm of digital and brain -computer interface is a pertinent need.

Questions for class to discuss:

- What effects does the high level of reidentification of brain data have on the privacy of individuals and groups?
- What technological and legal hurdles exist in marketing Nero wearable technology?
- What intellectual property rights (IPR) concerns exist in relation to the cognitive data of customers and the brain technologies of partners?
- How can the business continue to grow its collection of brain data to support its big data analytic business?
- How can the business guarantee the neuro-privacy of its clients who willingly disclose their cognitive data with intelligent sensing technology?
- What regulatory structure governs the gathering of brain data?
- What potential cyber threats and weaknesses are present for the data relating to the brain?
- What are the emerging human rights concerns arising out of emerging digital technology usage?
- What possible regulatory and ethical framework would be required for gaining trust/ legitimacy regarding brain data-based technology application?

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