What Matters in the Adoption of Human Resource Information Systems: An Empirical Study of Developing Country

G. M. Azmal Ali Quaosar[1], Nazifa Anbar Saba[1], Md. Abidur Rahman[1]

[1]Department of Management Studies, Comilla University, Bangladesh
Corresponding Author Email: abidrafi15@gmail.com

Abstract
Human Resource Information System (HRIS) adoption has drastically changed traditional HR, which is now completely inadequate. HRIS has a significant and strategic impact on organizations. Adoption and use of HRIS is low in developing countries for inadequate understanding of scope and effects of HRIS. This study used the Unified Theory of Acceptance and Use of Technology (UTAUT) model as its basis and introduced two other supplementary factors, Government Policy and Support (GPS) and Competitive Pressure (CP), to examine the determinants of HRIS acceptance and its practical application in developing countries, specifically in Bangladeshi organizations. A systematic and structured questionnaire was used to collect data from 264 participants. Structural Equation Modeling (SEM) with partial least squares (PLS) was employed to support and validate the model. Based on the findings, all selected factors have positive and direct effect on HRIS adoption. These findings are similarly important to the policymakers and HR professionals.
Keywords: Human Resource Information Systems, UTAUT, Government Policy & Support, Competitive Pressure, Structural Equation Modeling.

Introduction
Adoption of modern technology lowers operating costs while increasing productivity and quality of services (Zainol et al., 2017). Businesses' job designs, HR strategies, workplaces, and working conditions are all affected by it (Baloh and Trkman, 2003). Given these trends, the majority of conventional HR management systems are ineffective(Beckers and Bsat, 2002) and need to adopt HRIS in the organizations. The using technology has turned into a necessity to meet the HR challenges in the technology-based ecosystem. HRIS is defined as "a system that is used to obtain, store, manipulate, recuperate and deliver pertinent information about the organizational human resources" (Thite et al., 2012).

Their respective organizations' HR managers turn into important commercial partners. The way that IT and HR interact is leading to the emergence of HR technology, specifically HRIS, as a field that might bring HRM into the unknown and contemporary era(Lin, 1997). Modern HRIS capabilities rely on HRM's novel features to advance strategic HR management (Kavanagh and Johnson, 2015). Today's HR managers are highly interested on extensive use of HRIS (CedarCrestone, 2009) and organizations are vastly dependent on HRIS to increase the effectiveness of HRM (Obeidat, 2012, Troshani et al., 2011, Rahman et al., 2018). Organizations are getting more interested in acquiring, implementing, and using HRIS as a result of increased awareness of its capabilities and activities. Human resource management (HRM) is ultimately affected by each of the aforementioned elements (Purce, 2014, Park et al., 2004).

There is a growing urgency for companies in developing nations to identify the key behavioral factors that influence the adoption and impact of HRIS (Al-Dmour, 2020, Quaosar et al., 2018). Using this HRIS, a number of HR tasks may be carried out precisely, including payroll management, training and development, performance evaluation, job analysis, HR planning, and overall selection process (Scupola and Pollich, 2019). In industrialized nations, it is regarded as a strategic instrument to attain competitive advantages. Nevertheless, developing nations have facade many challenge in the execution and utilization of HRIS in both the service and industrial sectors (Rahman et al., 2016, Das et al., 2019, Alam and Kashem, 2022). As a result of insufficient knowledge and understanding of the potential consequences, developing countries seldom adopt and use HRIS. Spectrum HR, Kormee, ABS, Orbit, HRSOFT, CORT: HRMS, PEOPLE SOFT, and Oracle-HRMS are among the several human resource information systems (HRIS) utilized in Bangladeshi organizations.

The adoption of Human Resource Information Systems (HRIS) in Bangladeshi organizations remains at relatively nascent stage despite the growing recognition of its potential to enhance organizational efficiency, particularly in managing human capital. While businesses in industrialized nations have embraced HRIS to automate HR tasks, optimize workflows, and enhance decision-making, Bangladeshi organizations, particularly small and medium-sized enterprises (SMEs), are falling behind in terms of adoption and execution. Factors such as limited technological infrastructure, lack of awareness, financial constraints, and inadequate government support have contributed to this slow uptake. Furthermore, the rapidly changing business environment fueled by globalization and increasing competition, demands that Bangladeshi organizations improve operational efficiency to stay competitive. But if these companies do not implement cutting-edge HR tools, they run the risk of lagging behind local and international rivals. Given this situation, it is imperative to investigate the elements such as government policies, competitive pressure and so on. that affect HRIS adoption and how they might help Bangladeshi organizations to achieve higher adoption rates. In order to fill the research gap, this study looks at the important variables that affect HRIS adoption in Bangladeshi organizations. Its goal is to offer insights that would enable more widespread deployment and, in the end, enhance organizational performance throughout the nation.

Over the last twenty years, a significant amount of research has been done on human resource information systems (HRIS). Several researchers have primarily concentrated on the applications or utilization of it (Kassim et al., 2012,Bal et al., 2022, Bayraktaroglu et al., 2019) along with others. Some place focus on the prerequisites for effective adoption of HRIS

(Winkler et al., 2013,Safaa and Mohamed, 2020, Haines and Petit, 1997). Furthermore, a limited number of authors have also discussed the implementation of HRIS based on regions (Ngai and Wat, 2006, Moussa and Arbi, 2020, Teo et al., 2007). However, there is a significant lack of comprehension regarding the utilization and effective implementation of HRIS in developing nations such as Bangladesh. The primary research goal of the study is to examine the different factors that may impact the adoption of HRIS. The study aims to ascertain the relative importance of Government Policy and Support (GPS), Competitive Pressure (CP), and UTAUT constructs in the adoption of HRIS. The study makes a significant contribution by extending the UTAUT model through the introduction of two additional factors: Government Policy and Support (GPS) and Competitive Pressure (CP). By incorporating these supplementary variables, the research highlights the critical role of external environmental forces in shaping HRIS adoption, specifically contributing a major role in South Asian region. GPS emphasizes how government involvement, through policies and support initiatives, can either drive or hinder technological adoption in organizations. Meanwhile, CP reflects the influence of market dynamics and competition on organizational decision-making regarding HRIS implementation. These extensions provide a more comprehensive understanding of HRIS adoption in developing economies, broadening the UTAUT framework and offering practical insights for governments, businesses, and stakeholders. Additionally, it seeks to reduce the gap in the adoption and acceptance difficulties of HRIS.

Literature Review and Hypotheses Development
In the last two decades, organizations have experienced numerous changes for technological advancements, emergence of a knowledge-based economy, increased rivalry, globalization, and other causes. One of the biggest challenges in adapting to these changes is encouraging people to adopt and utilize novel technologies. A variety of prominent models were used to identify the key factors that impact the adoption and use of technology(Davis et al., 1989, Mamun, 2022, Quaosar et al., 2024, Uddin et al., 2020, Venkatesh and Davis, 2000). As a whole, these models have been widely justified to forecast the user acceptance and its usages.

After analyzing and combining eight leading models on the topic of technology adoption, researchers came up with the Unified Theory of Acceptance and Use of Technology (UTAUT) model (Venkatesh et al., 2003),these models are the following: TAM, MPTU, TPB, MM, TRA, SCT, and DOI, which stand for Technology Acceptance Model, Model of PC Utilization, Theory of Planned Behavior, Motivational Model, Theory of Reasoned Action, Social Cognitive Theory, Diffusion of Innovation Theory, respectively and also Combined TAM and TPB.UTAUT is widely utilized due to its better comprehensiveness and logical adjuration of existing models, making it more appropriate than any previous model for determining the outcomes in technology adoption and practical use. It can clarify 50% of actual use and 70% of variation in usage intention (Raaij and Schepers, 2008, Venkatesh et al., 2003).

HR professionals find HRIS is an essential tool to apply in HR sector. However, it is rarely seen in developing countries. For what, In order to know the prerequisites of HRIS adoption and it usages, researchers proposed the following model:
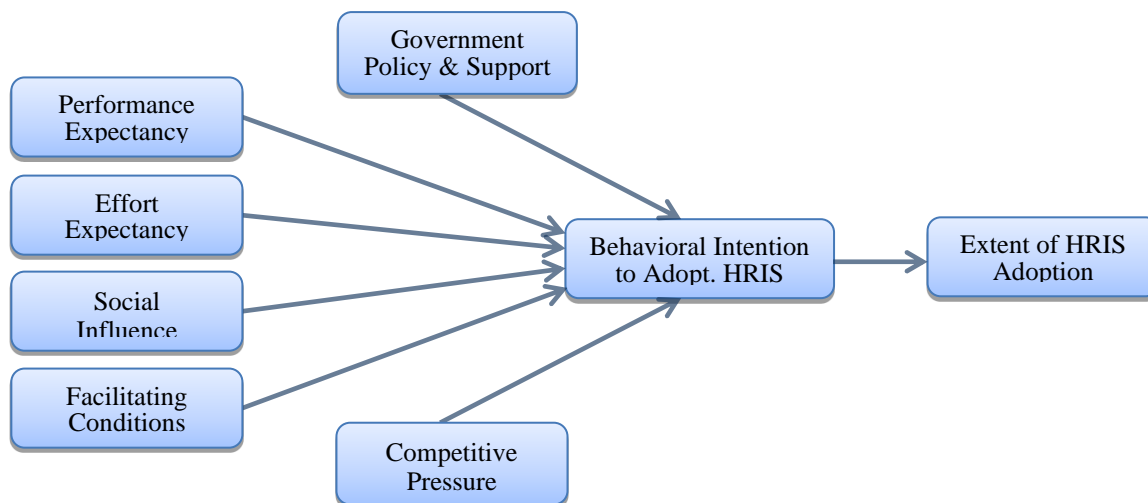
Figure 1: Research Model (Extended UTAUT model of the study)

Performance Expectancy and Behavioral Intention
Performance expectancy (PE) is "the degree to which an individual believes that using the system will help him or her to attain gains in job performance" (Venkatesh et al., 2003, Alalwan, 2020). job-fit (MPCU), extrinsic motivations (MM), relative advantage (IDT), Perceived usefulness (TAM/TAM2), and outcome expectations (SCT) are the variables that contribute to performance expectations. Among the many influential factors on technology adoption, Performance Expectancy (PE) of UTAUT stands out as particularly potent and consequential (Lee et al., 2011, Ali and Arshad, 2018, Hoque and Sorwar, 2017, Alam and Uddin, 2019). The adoption and utilization of technology are positively influenced by performance expectations (Islam et al., 2022, Quaosar et al., 2018, Carlsson et al., 2006). It is believed that HR professionals' positive perceptions of HRIS's effectiveness in businesses serve as the foundation for their behavioral intention to use HRIS. In light of these results as well as those of earlier research, the following theory is proposed:
H1: Performance expectancy has a positive impact on the behavioral intention to use HRIS.

Effort Expectancy and Behavioral Intention
Effort expectancy (EE) is "the degree of ease associated with the use of the system" (Venkatesh et al., 2003, Wei et al., 2021). It highlights a system's user-friendly aspects and significantly influences users' preference to adopt new technology, similarly EE is considered as a significant factors in technology adoption(Dwivedi et al., 2019, Samat et al., 2020). Its development is based on three distinct constructs: complexity (MPCU), ease of use (IDT), and perceived ease of use (TAM/TAM2). According to Percy and Van Belle (2012), this construct influences how someone feels about utilizing a technology and is a key factor in determining users'. From the above findings, a pertinent hypothesis to explore the impact of effort expectancy is:
H2: Effort expectancy has a positive impact on the behavioral intention to adopt HRIS.

Social Influence and Behavioral Intention
Social influence (SI) is "the degree to which an individual perceives that important others believe he or she should use the new system" (Venkatesh et al., 2003). Social expectations are a way to measure how people in a society are likely to use new technology (Shah et al.,

2021). It is constructed from the subjective norm (TPB/DTPB, TAM2, TRA, and C-TAM-TPB), the image (IDT), and the social variables in (MPCU). Fidani and Idrizi (2012), found a substantial correlation between behavioral intention and SI to accept any technology. Nonetheless, the (Al-Saedi et al., 2020, Arefin et al., 2016) study highlight the positive aspects and emphasizes the significance of social impact in forecasting the IU of M-payment. According to earlier research, intention to adopt and use technology is favorably correlated with social influence (Ain et al., 2016, Dwivedi et al., 2019). In light of the aforementioned theoretical and empirical justifications, the following hypothesis is thus put forth:

H3: Social influence has a positive impact on the behavioral intention to adopt HRIS.

Facilitating Condition and Behavioral Intention
Facilitating conditions (FC) are "the degree to which an individual believes that an organizational and technical infrastructure exists to support use of the system" (Venkatesh et al., 2003). FC covers the perceived suitability as well as the infrastructure and technical assistance for adopting new technologies(Alam et al., 2016). Research by Aggelidis and Chatzoglou (2009), shown that the presence of favorable FC has a substantial impact on people's intentions to use technology and it has an direct influence on intentions to behave and use technology (Mun et al., 2006). The adoption of novel technologies may be vague in the absence of technical infrastructural, knowledge and material resources from organizational strategic positions (Uddin et al., 2020). However, Yadegaridehkordi et al. (2020) and Altalhi (2021)discovered that FC had little predictive power over IU when it came to the uptake of online learning and cloud computing, respectively. Thus, given these contradictory results, the following hypothesis is drawn.

H4: Social influence has a positive impact on the behavioral intention to adopt HRIS.

Government Policy & Support and Behavioral Intention
Institutional factors, elite preferences, belief in or advocacy of change through modest increments, logical planning, and systematic forces combine to form government policy and support (GPS) (Fischer et al., 2015, Paulsson and Macheridis, 2023, Deygers and Vanbuel, 2022) and it has direct influence in adoption and use of any technology. A more rapid adoption of HRIS is possible with the help of government policies and support that shape the evolution of IT systems and data (David et al., 2023). This is because such government initiatives reduce the perceived risk, lower the cost of implementation, and create a conducive environment for technological innovation, thereby strengthening the behavioral intention to embrace HRIS within organizations. Typically, the government is important for promoting technology adoption through the means of offering training, fund supports and raising awareness (Chong and Ooi, 2008, Ngisau and Ibrahim, 2020). Cui et al. (2008), indicated in their study on Chinese companies that Government policies play a substantial influence in IT infrastructure as well as management, yet do not impact the IT usage directly.Fink (1998), has shown in his study on Australian SMEs, Grants from the government are not so important in getting people to adopt/use IT. Highlighting the complexity of this relationship, researchers hypothesized:

H5: Government policies and support has a positive impact on the behavioral intention to adopt HRIS.

Competitive Pressure and Behavioral Intention
Competitive pressure (CP) refers to the intensity of competition within the industries relevant to the company's operations (Lertwongsatien and Wongpinunwatana, 2003). Companies are

driven to embrace novel technology by competitive pressure and internal motivation to acquire a competitive edge. This pressure arises from various sources, including the company's supply chain, industry standards and the changes in business models (Shi and Yan, 2016). Alliance can be established to allocate resources for the purpose of providing innovative products or services in response to competition in a highly competitive environment. Organizations are inclined to embrace novelty for fierce competition in highly competitive environment and hence competitive pressure has a positive association with the technology adoption (Wong et al., 2020, Sin et al., 2016, Almoawi, 2011, Pfeffer and Leblebici, 1977). However a study conducted by Chang (2006), discovered a negative correlation between competitive pressure and technology adoption. From the above literatures, following hypothesis is postulated:

H6: Competitive pressure has a positive impact on the behavioral intention to adopt HRIS.

Behavior Intention to HRIS Adoption and extent of HRIS adoption
An individual's attitude towards using a system is their comprehensive sensory reaction to using that system (Venkatesh et al., 2003). Pickett et al. (2012), defined behavioral intention (BI) as "functions of both attitudes and subjective norms about the target behavior, predicting actual behavior". A person's behavioral intention is their plan to use technology for various purposes. The stronger the intention to adopt a technology system like HRIS, the more likely it is to implement the system extensively across various HR functions. Higher behavioral intention reflects greater commitment and preparedness, which leads to a broader and more comprehensive adoption of HRIS technology within the organization. Based on the UTAUT model, a positive correlation exists between behavioral intention and the use & extend of a specific technology (Venkatesh et al., 2012, Venkatesh and Zhang, 2010). Based on the above findings, the following hypothesis is put forth.

H7: Behavior Intention of HRIS adoption has a positive influence on extent of HRIS adoption.

Research Methodology
The survey method through structured questionnaire was used to collect data and the questionnaire was split into two sections. The first section part A consists of general information covering respondents' and firms' characteristics and in the second part specific questions were placed with 5 point scale or Likert scale, as five-point Likert scales are supposed to be more appropriate and reliable (Jenkins and Lloyd, 1985, Lissitz and Green, 1975). Purposive sampling technique has been applied to select respondents for the study, HR professionals and in few cases employers and top level management are considered to select respondents from the private and public Bangladeshi organizations. Person and region-based survey interaction techniques were exercised to make sure maximum response rates compare to online, postal and telephone survey and this technique can also ensure the accuracy of data, to minimize missing data as well as can avoid delays in context of developing countries (Malhotra, 2010).

Features of Sample
The study distributed and300 questionnaires and received 273 completed, comprising a response rate of 91%. While screening data for analysis, 264 questionnaires were finally selected after deleting outliers (4respondents), imputing missing values (2 respondent), and removing responses of unacceptable variance (3 respondent). Table 1 presents the respondents' demographic and other characteristics:

Variables	Categories	Frequency	Percentage
Gender	Male	212	80%
	Female	52	20%
Age	Below 30 years	20	8%
	31-40 years	62	23%
	41-50 years	116	44%
	Above 50 years	66	25%
Education	Bachelor	58	22%
	Master	134	51%
	PhD	26	10%
	Others	46	17%
Nature of Organization	RMG	66	25%
	Financing	80	30%
	Education	31	12%
	IT & Telecom	47	18%
	Others	40	15%
Year of Experience	1-5 years	29	11%
	6-10 years	52	20%
	11-15 years	67	25%
	16-20 years	55	21%
	Above 20 years	61	23%
Type of Organization	Public	68	26%
	Private	196	74%

Analytical Strategy

Data were collected between November to December, 2023. Researchers used a second-generation multivariate data analysis technique called Structural Equation Modeling (SEM), with an emphasis on the emerging path modeling approach called Partial Least Squares (PLS), to validate and justify the study's proposed model and determine the relationship between the hypotheses(Ringle et al., 2015, Statsoft, 2010). SEM is a well-known model for using empirical data to support theory (Götz et al., 2010).

Result

The Measurement Model

The reliability and validity have evaluated before testing the hypothesis(Bagozzi et al., 1991). Cronbach's alpha and composite reliability were used to evaluate the reliability. Acceptable values for a construct are 0.70 or higher for both Cronbach's alpha (α) and composite reliability (CR). According to Hair Jr et al. (2016), Internal reliability is absent if the value is less than 0.60. All of the study's constructs in Table 2 had composite reliability and Cronbach's alpha values greater than 0.80, which is above the advised threshold. Therefore, all the constructs had sufficient reliability. Convergent validity is tested using both discriminant and convergent validity; measurement constructs with an average variance extracted (AVE) of at least 0.50 are said to have adequate convergent validity(Hair Jr et al., 1995). The measurement model table shows that AVE ranged from 0.698 to 0.829 are greater than the recommended value. Therefore, conditions for convergent validity were met too.

Table 2			
The Measurement Model and Crossloading Matrix			
Construct	AVE	Composite Reliability	Cronbachs Alpha
Performance Expectancy (PE)	0.829	0.935	0.896
Effort Expectancy (EE)	0.796	0.921	0.872
Social Influence (SI)	0.822	0.933	0.892
Facility Conditions (FC)	0.728	0.931	0.907
Government Policy & Support (GPS)	0.744	0.884	0.915
Competitive Pressure (CP)	0.698	0.873	0.837
HRIS Adoption	0.771	0.910	0.851
EHRIS	0.752	0.915	0.864

The square root of the AVE and the cross loading matrix were used to evaluate the discriminant validity. For discriminant validity to be considered good, the square root of the AVE of a construct must to be higher than its correlation with other constructs (Henseler et al., 2009). Obtained data exhibited strong discriminant validity, as indicated by the square roots of AVE, which are displayed in Table 3, being greater than their corresponding correlation.

Table 3								
Correlation Matrix and Square Root of the Average Variance Extracted								
	PE	**EE**	**SI**	**FC**	**GPS**	**CP**	**HRIS Adoption**	**EHRIS**
Performance Expectancy (PE)	0.878							
Effort Expectancy (EE)	0.398	0.910						
Social Influence (SI)	0.374	0.435	0.892					
Facility Conditions (FC)	0.245	0.435	0.426	0.802				
Government Policy & Support (GPS)	-0.357	-0.487	-0.337	0.211	0.907			
Competitive Pressure (CP)	0.504	0.577	0.454	0.320	-0.581	0.853		
HRIS Adoption	0.287	0.477	0.340	0.455	-0.348	0.499	0.835	
EHRIS	0.329	0.435	0.237	0.536	0.264	0.342	0.432	0.645

Structural Model
To determine the path links between the constructs in the study model, the structural model was built. The hypothesis was tested using the bootstrap method. The study uses t-statistics and the path coefficient (β) to examine the relationship between the endogenous and exogenous variables. The study found that PE (t=4.650, β=0.41), EE (t=3.405, β=0.21), SI (t=4.475, β=-0.48), FC (t=4.305, β=0.34), Government Policy and Support (GPS) (t=3.107, β=-0.23), Competitive Pressure (CP) (t=4.302, β=-0.40) had a significant effect on HRIS adoption. In all hypotheses, t-test values are higher than 1.96. Thus H1, H2, H3, H4, H5 and H6 were supported. The final finding demonstrated that there is a positive correlation between the degree of HRIS adoption with the extent of HRIS adoption (t=2.302, β=0.117), supporting H7 (Table 4).

Table 4
Structural Model

Hypothesis	Path	β	T-Statistics	Comment
H1	PE -> HRIS	0.41	4.650	Accepted
H2	EE -> HRIS	0.21	3.405	Accepted
H3	SI -> HRIS	-0.48	4.475	Accepted
H4	FC -> HRIS	0.34	4.305	Accepted
H5	GPS -> HRIS	-0.23	3.107	Accepted
H6	CP -> HRIS	0.40	4.302	Accepted
H7	HRIS -> EHRIS	0.17	2.302	Accepted
Significant at p < 0.05.				

Conclusion
People in developing countries, may be digitally excluded due to a lack of understanding of the elements that influence in technology adoption. The study has established and validated a theoretical framework for HR professionals and higher-ups in businesses in order to comprehend the essential variables in the adoption and expansion of HRIS. The results indicate that performance expectations (PE), effort expectations (EE), social influence (SI), facilitating conditions (FC), Government Policy and Support (GPS), and Competitive Pressure (CP) are positively associated with the adoption of HRIS.

Theoretical Contributions
This study contributes to the body of knowledge on the adoption of HRIS by addressing focus on the unique socio-economic, and technological contexts of developing countries like Bangladesh. Second, the study enriches the existing adoption models by integrating the UTAUT framework with supplementary factors like Government Policy and Support and Competitive Pressure. The UTAUT model is widely used in the adoption and use of innovative technology. Organization's innovation process expedites the effective adoption of an information system. (Carlsson et al. (2006)), concluded that the UTAUT model adequately explained the organizational adoption of IT. By doing so, it provides a more comprehensive model that captures external influences often critical in the adoption decisions of organizations in developing countries.

The study has made a substantial contribution to firm's sense and understandings, regarding the adoption and extent of HRIS in developing nations like Bangladesh. With evidence, the

empirical study's conclusions are tied to IT adoption. Adoption and the extent of HR information technology are heavily influenced by the firm's environment. The study's practical contribution will guide organizations and senior management in the adoption of new IT systems or processes.

Limitations and Future Research Directions
Due to the fact that the research is initial ones in Bangladeshi organizations, it was not possible to bring up many concerns in its capture for discussion and resolution. These unexplored topics will be the focus of future research in this field. As these organizations are profit-driven, the management places an emphasis on generating a significant profit. To confirm profit and return from their business, management implements whatever they believe would yield the greatest return. Therefore, it is likewise advised that future researchers are encouraged to consider these difficulties. The use of technology is significantly influenced by culture and religion. Culture can be a potent component of future study.

Declarations
Funding
The authors received no financial support for the research, authorship, or publication of this study.

Declaration of Competing Interest
The authors declare that they have no competing interests that could influence the research work presented in this manuscript.

Ethical Compliance
This study employed an original dataset, and participants were not provided any monetary incentives to ensure the honesty and confidentiality of the collected data. Participants involved in the research are informed about the possibility of publication of research findings. Their consent for publication is obtained, ensuring their privacy and confidentiality are protected, and their identifiable information is appropriately anonymized. We ensure that our study was conducted in accordance with applicable ethical norms and adhered to established protocols for the treatment of human participants and handling of data.

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