ملحق (1): المقترح البحثي المقدم

A Blockchain Based Autism Services Platform

A Proposal Submitted to the ITAC Collaborative Research Fund as a PRP

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Disclosure Statement

The applicants of this proposal confirm that the deliverables of the proposed project have not been achieved before the time of submitting this proposal and, if approved for funding, will be genuine outcomes of the proposed project. No applications have been filed by the project team to any other funding agency, local or international, within the broad scope of the technology under investigation in this proposal.

Proposal Ownership

The applicants hereby attest that the proposal idea was initiated and owned by Arab Academy for Science and technology and Maritime transport (AASTMT) In the unfortunate case where the partnership ends, the AASTMT has the right to seek another partner and resubmit the proposal in the same or a subsequent round.

Consent Statement

The applicants are aware that the proposal evaluation process involves sharing the proposal documents with the assigned technical reviewers. Also parts of the proposal may be shared with other funding agencies as part of coordination and integration activities in case of similarities with other projects conducted by the project team members.

Statement for Non-Plagiarism

The contents of this proposal are prepared and presented in accordance with the non-plagiarism practices and ethical conduct known within the research community. The applicants of this proposal hereby attest of this proposal is their genuine writing, including due referencing to relative sources with no verbatim copy of material (including previous works of the applicants). The applicants are also aware that violation of such practices may result in blacklisting the applicants, i.e., automatic rejection of any future proposals, and notification of their institutions with such conduct.

Abstract

Autism is a neurodevelopmental disorder affecting about one in 100 children worldwide. The affected patient usually suffers from social communication difficulties, in addition to other challenges including restricted and repetitive behavior. Medical insurers tend to provide limited tailored services to patients born with health issues like autism. There exist a variety of nonprofit organizations supporting autism patients each on their special way. On the other hand, the digital transformation revolution is surging, transforming almost all aspects of our lives into digital platforms including social networking and introducing rich content that requires only a web browser to benefit from. However, such platforms are not all autism friendly to cope with the special needs of autism patients. Introducing an autism patient's services platform backed by a consortium of service providers will support autism patients with international electronic health record (IEHR) services in addition to autism ready multimedia content in two categories active and passive, with the active under two modes of operation offline or online. Autism ready multimedia content will help the patients develop and sustain their performance at the best possible efficiency. The platform will provide three different access channels, the patients access channel where they can benefit from their IEHR as well as the rich autism ready multimedia content. The physicians access channel where each can

communicate with their patients and upload performance assessments to the network. The teachers access channel where each teacher can upload educational content to their patients. The provided multimedia content will be performed by each patient's person of trust or interest (PAN) like physicians or teachers or optionally by each patient's person of trust according to the modes of operation.

The proposed platform is based on the blockchain technology, where a consortium of autism services providers collaborates and each act as a member node on the network. Each member provides the required computing power and storage capacity, and each will possess a copy of the distributed ledger. The model will be a private permissioned blockchain orchestrated by the consortium and accessible through a gateway for authorization. Blockchains provide high levels of security due to intensive cryptographic processes that leads to data being hashed into blocks and blocks being chained to each other, thus introduce the immutability properties of blockchains, and maximize integrity and privacy of the provided IEHRs. Furthermore, to maximize the utilization of the blockchain technology, persons of trust or interest can be rendered as non-fungible tokens (PAN) on the proposed platform as a non-mandatory option. Such that, the offline multimedia content may feature a 3D model of each patient's PAN playing a therapeutical or educational script uploaded by their physicians and teachers. While the online active multimedia content includes patient's interaction, where the 3D model of each patient's PAN communicates with the patients, receives feedback through facial and voice analysis to the platform backend, and update the 3D model's performance according to the patient's condition. And finally, the online active multimedia content is performed live by each patient's physician or teacher having their faces and voices deep faked with each patient's PAN. Each patient's PAN will be securely stored on the network as the 3D definition of each patient's PAN for passive content, or the deep fake definitions of faces and voices for the live sessions of the active content or the passive video content.

The proposed model introduces a blockchain based autism services platform that can be accessible to autism patients, their doctors, and their teachers each from their specified access channels. The platform provides IEHR for each patient to be accessible worldwide by authorized entities to maximize the quality of health care services provided to autism patients. The platform also provides rich autism multimedia content performed by each patient's PAN. This way, autism patients can enjoy therapeutical and educational autism friendly content rendered by each patient's PAN while enabling their doctors to feedback the network with their patient's assessments and on the same time their teachers to feedback the network with their patient's educational assessments to sustain autism patients' performance.

Introduction

Autism is a neurodevelopmental disorder affecting about one in 100 children worldwide [1]. The Autism and Developmental Disabilities Monitoring (ADDM) Network was launched by Centers for the Disease Control and Prevention (CDC) launched in 2000 In the USA, aiming to track the number and characteristics of children with ASD in the United States. According to data from the ADDM report in 2016, prevalence of ASD among children aged 4 years was 18.5/1000 (1:54). This figure ranged in different observed states between 13.1 – 31.4, and the portion of these children showing IQ scores ≤70 (accompanying intellectual impairment) was 33% (range 25%-42%). The disorder was more common in boys than in girls with a male: female ratio of 4.3:1 [2]. Few studies have been performed up to now in Middle East countries, generally yielding prevalence estimates lower than Western Countries.

The digital transformation revolution is surging, transforming almost all aspects of our lives into digital platforms including social networking and introducing rich content that requires only a web browser to benefit from. However, such platforms are not all autism friendly to cope with the special needs of autism patients. Introducing an autism patient's services platform backed by a consortium of service providers will support autism patients with international electronic health record services in addition to autism ready multimedia content in two categories active and passive.

Autism ready multimedia content will help the patients develop and sustain their performance at the best possible efficiency. Blockchain can be used to provide autism services platform that can be accessible to autism patients, their doctors, and their teachers each from their specified access channels. The platform provides IEHR for each patient to be accessible worldwide by authorized entities to maximize the quality of health care services provided to autism patients.

The blockchain technology utilizes a distributed immutable ledger (DLT) that allows transactions and assets to be recorded and tracked in a business network. The distributed ledger utilizes a local storage synchronized through member nodes of the network to store data digitally. Blockchains are the backbone technology of cryptocurrencies including Bitcoin [3][4]. Such technology can also be utilized to track tangible assets like land properties, vehicles and crops or intangible assets including copyrights and trademarks. Theoretically, all valuables can be traded and tracked on a blockchain network minimizing cost and risk for all involved parties [5]. Modern large businesses tend to exploit massive amounts of digital information that's preferred to be retrieved at maximum accuracy and speed. For this, a blockchain is one of the best options providing instant, shared and completely immutable and transparent information on a distributed ledger that is permissioned or permissionless according to business needs. All nodes have a synchronized copy of the distributed ledger and can view its immutable records according to privileges. Such methodology allows transactions to be recorded only once eliminating any duplication. In a blockchain, immutability is manifested as no member can modify an existing transaction. On the other hand, if a transaction has an error, a new one is added reversing the erroneous one and the two are recorded and are visible. A blockchain also has programmability properties manifested in the concept of smart contracts that can be referred to as chain code. Such contracts introduce a set of rules that executes automatically once the chain code conditions are fulfilled. Such concept can be utilized to speed up business processes. In a blockchain, transactions are encrypted and chronologically recorded in blocks. Each block is linked to the one before unless it is the

genesis block. This results in the data being blocked together in an irreversible chain where each block is chained to the ones before it, hence the entire blockchain introduces its immutability and manifests in a theoretically impossible to tamper network of transactions. A non-fungible token (NFT) is a digital asset that represents real-world items ranging from music, in game items all the way up to video and other objects. NFTs are generally encoded with the same underlying software of cryptocurrencies and are also sold with cryptocurrencies. NFTs existed since 2014 becoming so popular that almost more than 174 million dollars were spent on NFTs since November 2017 [6].

Name	Title	Affiliation	Role	Role justification	% Time dedication
Khaled Mahar	Professor	College of Computing and Information Technology (AASTMT)	PI	• Managing the achievement of all project work packages • Following up the design of Blockchain Autism Services Platform and its implementation	25%
Nahla Belal	Professor	College of Computing and Information Technology (AASTMT)	Co-PI	• Following up the design and implementation of the Multimedia Contents streaming • Following up the design and training of the deep neural network for text to voice	15%
Ahmed Maghawry	PhD	E-Finance	Consultant	• Following the design of the interface and web portal	25%
Ramy Shaaban	Associate Professor	AASTMT	Co-PI	• Assess the performance of the system and validate it.	10%
Ahmed Elshashai	Lecturer	AASTMT	Research Fellow	• His role is to test the system and supply the team with required medical information	10%

Amr El Hadidi	Engineer	E-Finance	Consultant	• His role is to design, model, and implement Blockchain of the Services Platform	30%
Mohamed Hesham	Professor	AASTMT	Consultant	• Medical Consultant	10%
To be decided	MSc Student	AASTMT	Researcher 1	• design of the interface and web porta	100%
To be decided	MSc Student	AASTMT	Researcher 2	• Modeling and implementation of the 3D Models of (PAN) and the methods of interaction	100%

Industry Analysis and Proposal Objectives

History and State-of-the-Art

The blockchain technology emerged to public in 2008 endorsed by the launching of bitcoin. However, many of the technologies on which the blockchains are based on emerged long before bitcoin, including the concepts of cryptography and the Merkel tree data structure. This concept was introduced by the computer scientist Ralph Merkle as an approach to public key distribution and digital signatures [7]. Shortly after the bitcoin was launched, Nakamoto mined the first bitcoin block to validate the blockchain concept. The block contained 50 bitcoins and was known as the genesis block. Shortly afterwards, the blockchain technology has gone mainstream with the bitcoin blockchain source being shared on GitHub and various institutions come together to form a consortium to utilize the blockchain technology to serve each's business domain including the B3i [8] and others. The existing research and activity aimed at assisting children with Autistic Spectrum Disorder in their educational pursuits (ASD).

The following survey summarizes work that addresses ASD education. To improve the social skills of children with ASD, Abdelmohsen et al [9] employed Unity 3D and a Desktop Virtual Environment that employs a virtual robot to interact with the participants through a social skill training programmed. This paper's benefit is that the virtual social robot implementation is less expensive, and the system may be downloaded and utilized by parents and teachers. The system's flaw is that it exclusively targets children aged 4 to 12.

Machine learning techniques are utilized by Joseph Mintz et al. [10] to anticipate student reaction based on the type of communication employed by teachers in certain classroom situations and in connection to specific student characteristics. Our study, which used a sample of 5460 coded exchanges between teachers and seven students, offers light on the varying efficiency of different communication styles and shows how this strategy might help with autism education.

Kavitha V. et al. [11] used the Unity Game Engine and a mobile app to encourage children to interact more with their teacher, parents, and their environment. Additionally, the technology aids in the child's engagement with his or her learning curriculum by providing instruction in an appealing and enjoyable manner. The advantage of this paper is that the system's user interface is basic and clutter-free, making it easier for children to access and operate. However, the system still lacks several functions.

GarciaGarcia1 et al. [12] used an emotion recognition game to teach children with ASD how to recognize and express emotions as well as improve their relationship. This system produces positive results and user approval; nevertheless, there has been no long-term examination of its impact on learning.

Erin E. Soares et al. [13] used meta-analytic approaches to assess preliminary evidence for Behavioral Intervention Technologies social skills training (BITs -SST) using face-to-face social skills training (F2F-SST). This article provides preliminary evidence that using technological platforms to deliver SST to kids with ASD has promise. This method has the potential to lower some of the costs associated with accessing services for people with ASD and their families.

Mohammed Alharbi [14] used Microsoft Emotion API to create a child-friendly ASD game (Ying) that integrates several behavior and communication approaches to help children with ASD improve their communication and social skills. The benefits of this paper are that it improves the behavioral and social abilities of ASD children. The fact that Ying is not available for iOS or Windows is a flaw in this study.

The study in [15] summarizes the variety and efficacy of AI-assisted solutions built using machine learning models and used to address learning issues in kids with a variety of neurodevelopmental disorders (NDDs). The evidence that AI tools can be utilized to promote social interaction and supportive education is summarized in this review. We make recommendations for the creation of future AI tools based on the limits of existing AI tools, with a focus on enabling individualized learning for people with NDDs.

In [16], a method is suggested for automatically recognizing small and similar motions in a humanoid-robot therapy for ASD youngsters named IOGIOCO. IOGIOCO is a multi-level HRI therapy that uses a feedback interaction to teach 19 meaningful gestures in a semantic framework. The 3D coordinates of body key points collected by a Kinect were used to track gestures. To construct the offline model, a Residual Neural Network was implemented and trained on a segmented dataset gathered during this investigation, which was subsequently utilized in a real-time classification utilizing a sliding window.

In [20], “Smart Secure Telerehabilitation Apps for Personalized Autism Home Intervention Using Blockchain System (ATA)”. Researchers in [20] utilized the blockchain technology to introduce a secure electronic health record (EHR) for each patient. Such EHRs are then accessible only to permissioned individuals according to each activity initiator. The blockchain along with a mobile application access channel is overall utilized to provide the concept of protected health information.

Industry and Market Analysis

It is with no doubt that the novel corona virus (COVID-19) boosted the digital transformation revolution to a point that made it faster than ever. Due to the worldwide pandemic, the entire economy started investing in digital solutions to cope with lock downs and the increased data streams due to the exponentially increasing digital adoption. The digital ledger technology is no exception as it is used in digital payment processing in a variety of domains. Blockchains was also used in different business domains including the agriculture domain of crops tracking [17]. In addition to that, institutions like Autism Speaks started an initiative for the donation of cryptocurrencies to autism patients [18]. Furthermore, the blockchain technology affected autism patients positively with the AUTZ token being established and dedicated as a charity-oriented token with the ultimate goal to support autism patients [19]. Hence, the utilization of the blockchain technology to help support autism patients has been a very active domain lately.

Proposal Objectives

1- Enhance learning and interaction ability of disadvantaged autistic patients.

2- Introduce autism friendly digital platform by exploiting properties of the blockchain technology.
3- Raise awareness about autistic patients.

Marketing Strategy

The proposed methodology assumes a consortium of all autism supporting institutions to come together in an alliance to form a private permissioned blockchain network dedicated for serving autism patients and labeled as the Blockchain Autism Services Platform B.A.S.P. The platform registers any autism patient for free and introduces an international electronic health record IEHR for all registered autism patients. The IEHR can be accessible through any authorized medical entity serving the patient (Hospital, Clinic). Authorized entities can be decided by the consortium as per marketing goals that aims mainly to maximize the quality and experience of health care providing to autism patients. In addition to this, the platform to offer channels to physicians and teachers to deliver their services to autism patients as mentioned in the proposed model. Furthermore, the platform also offers multimedia content in three forms, therapeutical, educational and entertainment also as specified earlier. The marketing strategy can be concluded in the below points:

1. The proposed platform is dedicated to providing services for autism patients.
2. The proposed platform to be empowered by a consortium of autism service providing institutions.
3. Parties to be encouraged to participate in such an effort as below:
    a. Service providing institutions will share services traffic with other institutions through the consortium.
    b. The platform to embrace the AUTZ cryptocurrency as a payment method.
    c. Professional service providers (Hospitals, Clinics, Teachers, Physicians) to get paid in AUTZ.
    d. Consortium members to receive charity fees from AUTZ transactions.
4. Competition may not be an issue as the proposed platform endorses an idea of a consortium where all autism charity institutions are welcome to participate.
5. The success of such platform can be measured with the below points:
    a. The number of registered autism patients.
    b. The number of registered physicians.
    c. The number of registered teachers.
    d. The number of registered professional service providers.
    e. The AUTZ transactions volume through the platform.
    f. The size of the available multimedia content.
    g. The total number of services provided through the platform since its launching.

The below table shows the five Ps of marketing of the proposed platform.

P	Description
Product	Digital autism services platform based on the blockchain technology
Price	Free for autism patients
Place	Online
Promotion	Deliver high quality services for autism patients
People	Autism patients

Statement of Proposed Research

Detailed Research Proposal

The proposed model introduces a blockchain based platform orchestrated by a consortium of institutions supporting autism patients. The platform provides a variety of services for autism patients including an international electronic health record (IEHR) that contains all health information related to the patient in addition to information related to the condition itself like the continuous assessments required by their treating physician as a person of interest (POI). As an additional option, the platform also provides the concept of person of trust or interest as a non-fungible token (PAN). The person of interest can be the patient's parents, friends or even their favorite celebrity with regards to copy rights. The platform will also provide educational or entertainment multimedia content as scripts that can be played by the patient's PAN. The figures below describe the outline of the proposed model. Figure 1 shows abstract of the proposed model, while Figure 2 shows the methodologies stack utilized to constitute the proposed model. Starting from the base blockchain engine utilizing the concepts of Merkel trees, cryptography and the DLT. The blockchain base will include all digital assets related to autism patients including multimedia content and each patient's IEHR. Data is rendered from the blockchain technology through AI filters to introduce the intelligent behavior of the proposed platform including learning and optimization. The AI layers reflects its effect on the introduced content through deep faking, or even learning the patient's patterns to introduce patient specific customized content to suite each patient's needs. And finally, the provided content is introduced to the beneficiary through each role specific access channel.

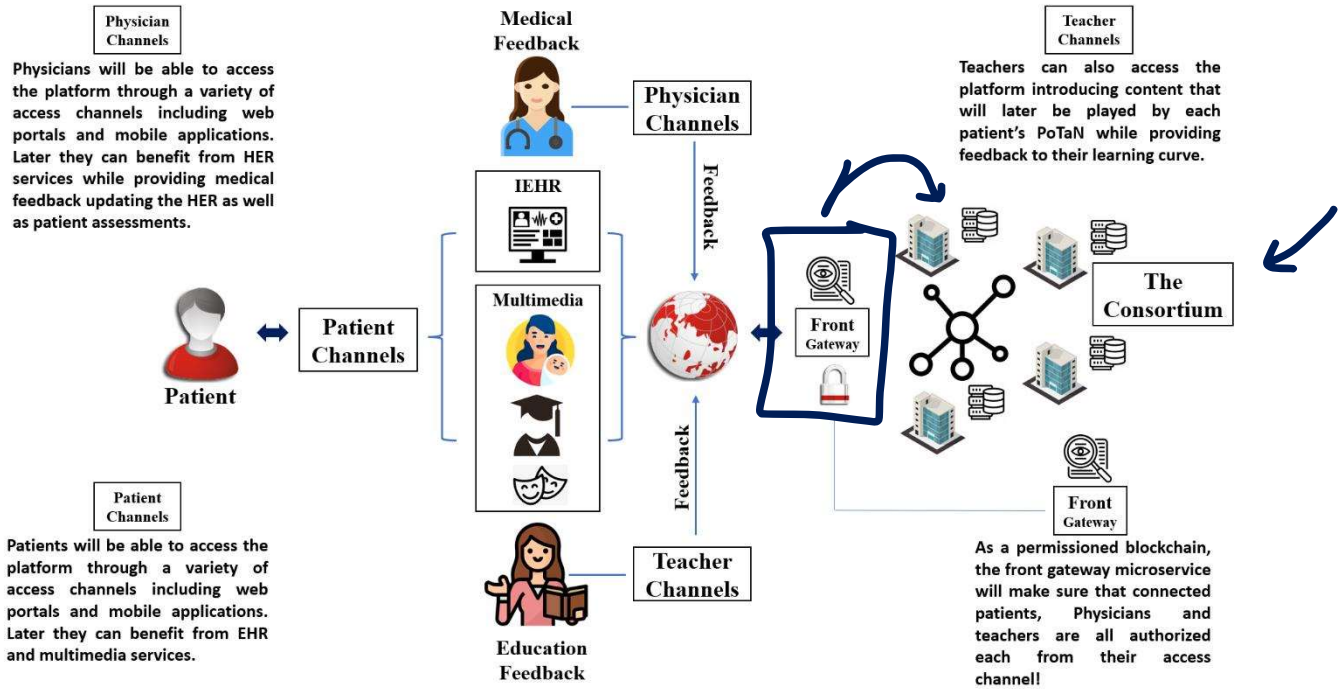

Figure 1. Proposed model abstract

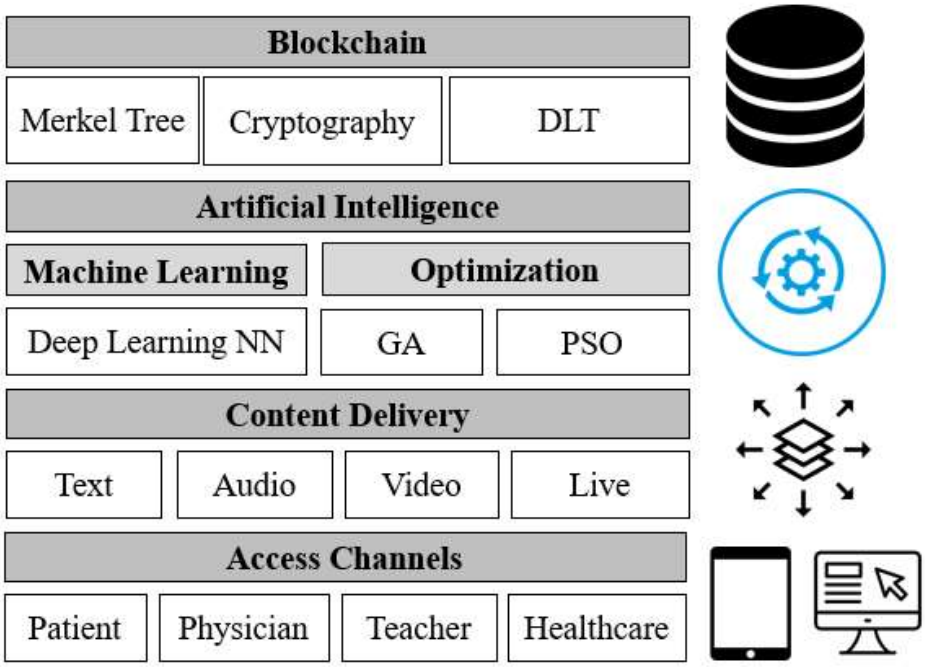

Figure 2. Methodologies stack.

The multimedia services provided by the platform will be based on PANs like teachers and physicians introducing physiological or educational scripts in the form of text, audio or even video. Once composed, physicians and teachers can upload their educational or therapeutical scripts onto the platform and assign each for a pool of patients each according to their condition and progress. As a non-mandatory option, Text can later be narrated by each patient's PAN's voice. Audio can also be deep faked into each patient's PAN and finally videos performed by physicians or teachers can also be deep faked by each patient's PAN's face and voice. The platform will provide active or passive multimedia content, where the passive content will be text, audio or videos, while active content will provide patient interaction properties in two modes, offline or online

The offline mode will involve the patient's 3D model of their PAN that can utilize a combination of artificial intelligence techniques to allow the 3D model to interact with the patient through speech synthesis, AI based dialog engine, AI based adaptation module while performing a real time emotional analytics regarding the patient's voice and facial analysis as well as text if chatting with the model is allowed. The below figure describes the offline mode of interactive multimedia content where the patient is exposed to the content, while cameras and microphones and other sensors read their facial and acoustic feedback and then streams the feedback to the BASP engine for training, and finally the engine alters the script to suite each patient's condition.

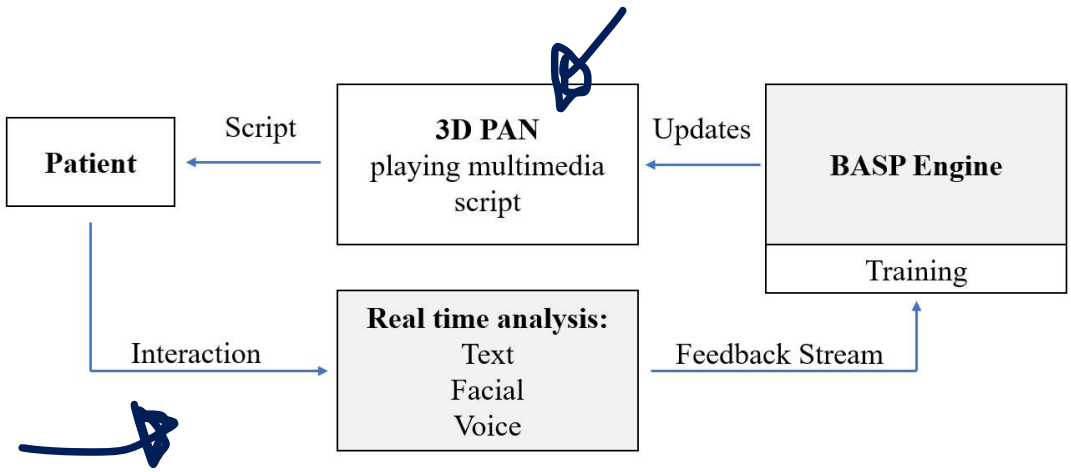

Figure 3. The offline interactive multimedia mode

The online mode will involve a live performance of a physician or a teacher with each's face, and voice deep faked with the patient's PAN providing the closest possible human natural content. The figure below describes the online mode where the same happens as in the offline mode, except that the content performer is an actual person receiving insights from the engine about the patient's condition for the best patient experience.

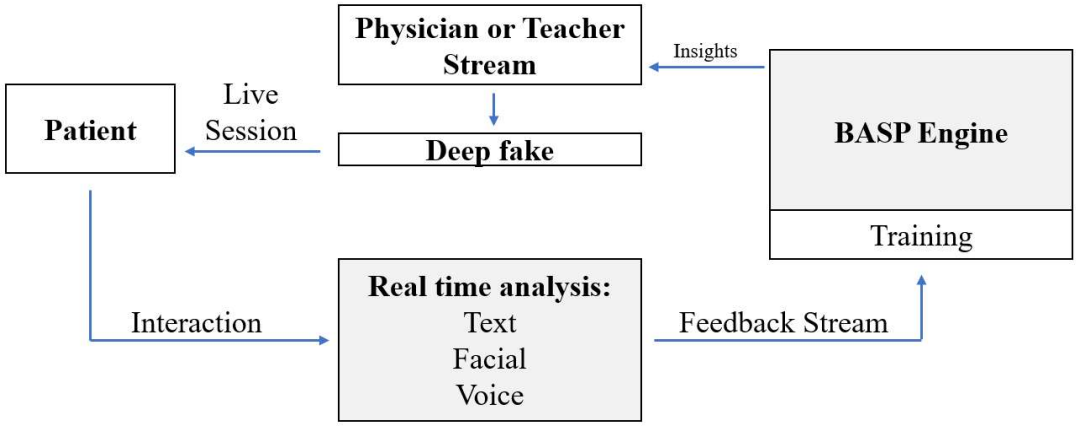

Figure 4. The online interactive multimedia mode

The table below represents a comparison between the model to be proposed "Blockchain Autism Services Platform" and the ATA.

	BASP	ATA[1]
Private Permissioned Blockchain	Supported	Supported
Secure Electronic Health Record	Supported	Supported
Mobile Access Channels	Supported	Supported
International EHR	Supported	N\A
Non-Fungible Tokens	Supported	N\A

Educational Multimedia Content	Supported	N\A
Entertainment Multimedia Content	Supported	N\A
AI patient response analysis	Supported	N\A
Vital Signs Integration through IoT	N\A	Supported

Detailed SMART Objectives/Deliverables

1. Raise the awareness about applying intelligent systems in education of autistic patients.
2. Raise awareness about consortium of autistics patients.
3. Test the system using 10 autism patients.
4. One researcher working on this proposal will exploit the research outcomes in their postgraduate studies. .

Methodology and Execution Plan

The Starting Point: [Select Idea/Proof-of-Concept/Prototype]

Perform a survey study targeting the blockchain technology, DLTs and autism patients' adoption to digital platform.

Technical Methods/Approaches

- A blockchain based platform core.
- NFTs to render each patient's person of trust\interest introducing the concept of persons as a non-fungible tokens PAN.
- Artificial intelligence-based content manipulation through:
  - Deep learning using neural networks
  - Optimization using hybrid genetic algorithms and particle swarm optimization.
- Deep faking for content manipulation.
- Unity \ OpenGL for 3D models rendering.

Work Packages and Reporting Scheme

With the clear description of the project starting point and the technical methods, distribution of the project tasks over the project team should be provided. The reporting scheme necessary to guarantee smooth flow of the execution plan should be given.

WP1:

Work package number	**1**	**Start Month**	1	**End Month**	2
Work package title	Preparation				
Objectives of this work package					

Establish a baseline knowledge base to build guidelines for the upcoming work packages of the project until fulfillment.
Description of work Task 1.1: Investigate autism patients' digital adoption Task 1.2: Investigate available methodologies utilized to support autism patients. Task 1.3: Investigate the role of the blockchain technology to support autism patients. Task 1.4: Scout possible institutions that can be targeted for the consortium.
Deliverables 1. Survey and literature review.

WP2:

Work package number	**2**	**Start Month**	3	**End Month**	5
Work package title	System design, modeling, and simulation				
Objectives of this work package Design the proposed platform's model(s) and exploit any possible simulation opportunities to get a robust definition of the proposed model structure.					
Description of work *Task 2.1:* High level proposed methodology. *Task 2.2:* Breakdown of sub models into full details. *Task 2.3:* Define sub models integration details. Task 2.4: Define professional service providers integration specification. *Task 2.4:* Define platforms services details.					
Deliverables					

The main deliverable of this WP can be summarized in the following bullets:

- Proposed model definition.
- Sub models definition.
- Sub models integration definition.
- Professional service providers integration definition.
- Proposed model(s) and integration paper(s).

WP3:

Work package number	**3**	**Start Month**	6	**End Month**	11
Work package title	System practical implementation, troubleshooting, performance assessment, and evaluation.				

Objectives of this work package

Produce a usable system to proof the concept of the proposal idea.

Description of work

Task 3.1: Sub models implementation in the form of microservices.

Task 3.2: Microservices integration.

Task 3.3: Final platform implementation.

Task 3.4: Security penetration testing.

Task 3.5: Stress testing.

Task 3.6: UAT.

Deliverables

- A full system prototype with the proposed system design.
- A technical feasibility study of a field prototype is completed based on the findings from the small-scale prototype in conjunction with the developed simulation models.

WP4:

Work package number	**4**	**Start Month**	12	**End Month**	12
Work package title	Dissemination and sustainability				
Objectives of this work package Submission of journal/conference papers, launching a website for the project, marketing the proposed idea, and introducing it to the Egyptian decision-makers, and participating in national and international exhibitions.					
Description of work *Task 4.1*: Proposed methodology research paper. *Task 4.2*: B.A.S.P website. *Task 4.3*: Marketing. *Task 4.4*: Introduce to Egyptian decision makers.					
Deliverables • Research paper. • Website. • Marketing campaign outcomes.					

Milestones and Gantt Chart

The ITAC funds projects on a milestone-by-milestone basis. A milestone is typically 4 or 5 months. The project plan is expected to be divided among each milestone, with clear deliverables at the end of each. Notice that the milestone will serve as a checkpoint for the success of the project. Thus, clear measures of success at the end of every milestone should be indicated. Typically, a Gantt chart is used to summarize the execution plan flow.

Task No.	Title of Task/Sub-task	Start Date	End Date	Duration (Months)	Year 1												Expected measurable outcomes of successful implementation of the task
					M 1	M 2	M 3	M 4	M 5	M 6	M 7	M 8	M 9	M 10	M 11	M 12	
1	**Preparation**			2													Submission of progress report 1
1.1				1													
1.2				1													
2	**System design**			3													Submission of progress report 2
2.1				2													
2.2				2													
2.3				1													
2.4				2													A detailed report on the simulations results + conference paper
2.5				1													A detailed report combining system performance results
3	**System performance validation**			6													Submission of progress report 3

3.1				3													A lab-scale test rig is constructed
3.2				2													
3.3				1													
3.4				2													A detailed report on experimental results
4	**Dissemination and communication**			1													Submission of progress report 4
4.1				1													
4.2				1													Feasibility study of the proposed system
4.3				1													
4.4				1													Submission of conference and journal papers

المرحلة الثالثة:

اسم المسافر	جهة الرحلة	عدد الليالي	البدل اليومي بالعملة الأجنبية	إجمالي البدل اليومي بالعملة الأجنبية	سعر الصرف السائد	إجمالي البدل اليومي بالجنيه المصري	تكلفة تذكرة الطائرة	رسوم تسجيل	إجمالي تكلفة النشر (بالجنيه المصري)	إجمالي التكلفة (بالجنيه المصري)
	رسوم نشر بمجلة علمية							22400	22400	22400
الإجمالي										22400

ميزانية المعدات

المرحلة الأولى

	وصف البند	عدد الوحدات	تكلفة الوحدة	التكلفة الإجمالية
1	VR Camera	3	5586.667	17060
	الإجمالي			17060

Projected Income/ROI/Financial Plan

If your project is a PDP, a financial plan should be given with forecasted income, break-even point definition … etc. A clear justification and explanation of how the income is calculated should be given. A projection or vision of such financial plan may be useful to see in an ARP.

References

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Appendices

As with any report, proposal or manuscript, technical parts with no impact on the flow of the proposal writing should be provided in an appendix for the interested reader to refer to at his own discretion.

Biographies

Khaled M. Mahar received the B.Sc. and M.Sc. degrees in computer Engineering from Alexandria University, Egypt, in 1986 and 1990 respectively. He obtained his Ph.D. degree from faculty of engineering, Cairo University, Egypt, in 1996. He is currently a professor at college of computing and Information technology, Arab academy for science and technology, Egypt, where he is also a Dean of Arab Center of artificial intelligence. His research interests include machine learning, intelligent systems, image processing and analysis, and software engineering.

Nahla A. Belal obtained her B.Sc. in Computer Engineering in 2002, followed by her M.Sc.in Computer Engineering in 2005, both from the Arab Academy for Science, Technology, and Maritime Transport (AASTMT). After that she worked as a Teaching Assistant in the Computer Science Department of the College of Computing and Information Technology (AASTMT). Nahla received her Ph.D. degree in Computer Science with Bioinformatics option early in 2011 from Virginia Polytechnic Institute and State University (Virginia Tech). She got appointed as an Assistant Professor in the Computer Science department, College of Computing and Information Technology, AASTMT. She is currently a professor, and vice dean for educational and student affairs. Nahla has research interests in algorithms, graph theory, problem solving, machine learning, bioinformatics, and computational biology.

Mohamed Hesham is the current Dean of AASTMT College of Medicine. Dr. Hesham is a professor of Otolaryngology and Head and Neck Surgery with an MD from Alexandria University. He was the vice-dean of students' affairs from 2015 until 2020. Dr. Hesham is also a consultant for the Military Hospitals, Petrol Hospital, and Elshorta Hospital. He is also a member of multiple ENT societies including the Egyptian Society of ORL-Head and Neck Surgery, Egyptian Society of Head and Neck Cancer, European Society of Head and Neck Oncology. Dr. Hesham is the Egyptian representative of the international federation of Head and Neck Oncologic Societies. His main research and clinical interest is in the field of Head and Neck Diseases and Oncology.

Ahmed Elsheshai is a psychiatry consultant and lecturer of medicine in the Arab Academy for Science and Technology (AAST) – College of Medicine. He graduated from Alexandria Faculty of Medicine with honor in 2004. He then went on to receive a Master of Science (MSc) in neuropsychiatry (2011) and a medical doctorate (MD) in psychiatry (2019) from the same faculty. On 2019 Dr Ahmed also became a member of the Royal College of Psychiatrists (MRCPsych) in the UK. He is currently a licensed psychiatry consultant in Egypt and the UK. His published research include work on sleep architecture and correlation between psychometric tools and prediction of relapse in recovering opiate addicts. Other research interests include biologic psychiatry and functional recovery in psychiatric patients. A special passion for Dr Ahmed is helping chronic psychiatric patients achieve their full potential and overcome disability to become independent members of society.

Ramy Shaaban is an associate professor of medical education at the Arab academy of science and technology. He is also an assistant professor of instructional technology and learning sciences at Utah State University in Utah, USA. He got an MD degree from Alexandria University. His MSc and PhD degrees were obtained from Indiana University of Pennsylvania in the United States. Dr. Shaaban was also the assistant director of innovation and transformation at Cincinnati Children's Hospital Medical Centre in Ohio, USA. His research interests include, but are not limited to, exploring the impact of

emerging technologies on learning in the educational field. He, specifically, believes that gamification and game-based learning, aided with scaffolding and collaborative learning, are the gateways to future learning styles and students' preferences. Dr. Shaaban was able to secure a grant for the Department of Communications Media at the Indiana University of Pennsylvania to build a VR simulation lab, which allowed for more exploration of the effectiveness of virtual reality on students' learning.

Dr. Ahmed Maghawry is a software development team leader at efinance. He got a BSc in computer science from October 6 university. His MSc and PhD degrees were obtained from the Arab academy for science, technology, and maritime transport. He was a part of the software development team that participated in multiple large-scale projects in the financial industry, petroleum industry and agriculture industry. His research interest includes, but are not limited to, exploring the impact of unconventional technologies in the post digital transformation market, including artificial intelligence, blockchains and disruptive technologies. He believes that for each business, the leverage and usage of disruptive technologies, AI and blockchains must be well defined as such definition will shape the future of each business in the post digital transformation market.

Amr Elhadidy Software Engineer with six years of experience in the Software Engineering field.Ex-IBM, Ex-Orange and currently working at e-finance as a Senior Software Engineer. Graduated from Misr Academy of Engineering and Technology, Major Communications and Electronic Engineering. Fields of knowledge: Windows Apps Development, Image and video processing, SQL Databases, Software Development Security, Web Development, Blockchain, Mobile Development (Android), ETL, Agile and DevOps (CI, CD)