Intellectual Property Awareness App Using Design Thinking Approach

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***Abstract*- One of the primary objectives of this is to create educational tools and resources for Intellectual Property Awareness at the school level. School students learn best when technical areas of law are gamified and interactive. The interactive gaming application aims to teach the basics of Intellectual property rights (IPR) to students, including Patents, Trademarks, Copyrights, and Designs that can be used both inside and outside of the classroom. It includes elements such as a scoreboard, a map of progress, factual titbits, and a quick recap at the end. On completion of the game, the students will be able to have a basic understanding of these IPs as a learning outcome. This app is user-centric and concentrates only on the benefits of the user on how and what they learn during the procedure.**

***Keywords*: Intellectual Property Rights, mobile app, Teaching IP, Educational, gamified learning**

I. INTRODUCTION

The IPR awareness game app is exclusively designed to make primary and secondary students understand the importance of IPR and what steps they can take to make a move towards creating and innovating objects, and articles such that they can achieve patents, copyrights, trademarks, trade secrets, etc. It has audio references, video clippings, pictorial representations, and games that are based on riddles and aptitudes.
It is to bring an understanding of intellectual property rights to children and plant the seed of that very particular topic. This app is specifically designed to bring a deeper understanding of intellectual property rights as students these days only know the basics and the top layer of the topic.

The main objective of this Intellectual property rights app is that when young students learn and get to know about the property they will research and know more about it and find ways to use it in real life without the hesitation of trying. This way they would have gained knowledge of IPR by the time they were in college or would have started a business. As freshers in business, they need to know about IPR. This does not only make students think about learning, inventing, innovating, or creating but also will make students think about earning with the help of their creativity and talents and also shows how their contribution would be.

II. RELATED WORKS

[1] Maria Chroni Angelos Fylakis Stavros D. Nikolopoulos developed the WaterIP system which serves as an effective educational tool for teaching students about intellectual property rights. It boasts a user-friendly interface, ensuring ease of use and allowing students to concentrate on core concepts without grappling with technical complexities. Furthermore, it generates high-quality watermarked images, preserving the integrity and visual appeal of the original content, which is crucial for practical understanding. The system has been designed for optimal time and space performance, ensuring efficient operations when embedding and extracting watermarks. While potential disadvantages are not explicitly mentioned in the provided context, it's important to acknowledge that like any educational tool, it may have inherent limitations or challenges that warrant further evaluation.

[2] C. Gururaj from the Department of Telecommunication Engineering developed Active learning approaches in teaching intellectual property rights (IPR) in engineering education which offers benefits such as increased student engagement, better understanding of IPR concepts, the development of critical thinking and teamwork skills, and personalized learning. However, they also have potential drawbacks, including being time-consuming to plan and assess, classroom management challenges in larger classes, possible student resistance to a shift from passive learning, and complexities in assessing student performance. These advantages and disadvantages need consideration when implementing active learning methods for teaching IPR in engineering education.

[3] Jun Lin, Wen Long, Anting Zhang, and Yueting Chai have developed a high-level design that integrates blockchain and IoT technologies for intellectual property rights (IPR) protection. This innovative design combines the security and transparency of blockchain with the automation capabilities of IoT. It enables multiple users to engage in IPR protection without the need for a central authority. However, the implementation presents challenges, including complexity and scalability issues. Privacy concerns are also a consideration due to IoT data. Achieving success with this design requires broad adoption and interoperability, emphasizing the importance of careful planning and expertise to effectively address technological and privacy-related aspects.

[4] Wen-Qi Liu AND Xiao-Peng Yu offer a comprehensive educational approach that centers on intellectual property (IP) awareness and the development of innovative learning skills. It skillfully integrates both theoretical and practical elements, providing students with a well-rounded understanding of IP protection in the context of circuit design and advanced technology within the field of engineering. However, it may have limited applicability beyond specialized areas, requiring a strong foundation in circuit design. The course involves substantial time commitment from students, primarily due to project requirements, which could pose challenges. Furthermore, the limited lecture hours necessitate a highly focused curriculum, potentially constraining its broader applicability. Variations in student satisfaction levels, particularly between undergraduate and postgraduate students, warrant consideration during the course's implementation.

[5] Sheikh Tariq Mahmood Wanted to raise awareness among research students about plagiarism and intellectual property rights (IPR), particularly among PhD and MPhil students. It also identifies areas where students lack knowledge, allowing for targeted training programs. The importance of providing clear concepts and training is emphasized, recognizing that awareness alone is insufficient. However, it's important to note the limitations of the document, which include a relatively small sample size of 60 research students, potentially limiting generalizability. The lack of detailed methodology information raises questions about the study's reliability, and the limited use of external sources may narrow the scope of information presented.

III. METHODOLOGY

This app was exclusively developed and built to engage primary and secondary students about intellectual property rights in their leisure time. It mainly focuses on the creativity of the students. It was designed based on the psychology of students such that they learn through the method they like. It is a hub that comprises so many games.

This app is user-friendly and user-centric and concentrates on the understanding of the students. The topic covered becomes higher as the level increases and provides in-depth knowledge to students of the concept. The methodology used here is the 5 design stages that include empathy, ideate, define, prototype, and test. This way the problems faced by the students while learning were. revealed and the necessary changes were made accordingly. The feedback from the student's teachers and parents played a vital role in building the app. They were a regular part of the testing and were present at all the stages of the design thinking. This was very useful as the changes were made according to the reviews of them.

The app was developed in such a way that a variety of students with various sides of interest will be able to access it and will also develop a part of eagerness and fondness towards intellectual property rights and will be able to use it in their leisure and make productive use of it,

S. NO.	TITLE	AUTHOR NAME	ADVANTAGE	DISADVANTAGE
1.	A Watermarking System for Teaching Intellectual Property Rights	Maria Chroni, Angelos Fylakis, Stavros D. Nikolopoulos	Educational effectiveness User-friendly interface Optimal time and space performance	Dependency on Smartphone Technology Limited Accessibility Android Platform Specific

2.	Active Learning Approaches To Teach Intellectual Property Rights	C. Gururaj	Enhanced student engagement Development of critical thinking skills Improved understanding	Time-consuming Assessment difficulties Classroom management challenges
3.	architecture design for intellectual property protection	Jun Lin, Wen Long, Anting Zhang, and Yueting Chai	Trust and transparency Automation and efficiency Security and tamper-proof	Privacy concerns Adoption and interoperability Complexity
4.	Cultivating Intellectual Property Education in the Electronics Engineering Curriculum	Wen-Qi Liu and Xiao-Peng Yu	Enhancing Innovative Learning Capabilities Improved IP awareness	Varied satisfaction levels among students Limited lecture hours for focused content
5.	Intellectual Property Right and Patent: Conceptual Awareness	Sheikh Tariq Mahmood	Increased awareness Importance of clear concepts and training Identification of areas of improvement	Lack of methodology details Lack of external sources Limited sample size

IV. 5 STAGES OF DESIGN THINKING

STAGE - 1: EMPATHIZE

In the empathy stage of Intellectual property rights awareness, interrogations were done and questions were asked to primary and secondary students about intellectual property rights, it came to be that most of them were not aware of what IPR was and eagerly started asking questions about the same. Parents felt that this awareness to students was very much needed as it would show them different ways they can be innovative and creative.

Surveys and interviews were conducted from which it was found that the game was a good way to make children eager to learn. Students should unlock creative skills. They shared their experiences on how they tried to learn from the other sources but faced difficulty in paying attention and understanding.

Teachers and parents also shared that this way the children who lack confidence would believe in themselves and start having self-confidence, their motive and ultimate aim became to give at least a basic understanding of IPR to the kids,

how they can earn from their creativity, and how this will help the world be a better place to live in by their innovations and creations. This will be an engaging and effective intellectual property education tool.

STAGE - 2: DEFINE

"From the empathy stage, we found that school students do not have much knowledge about intellectual property rights therefore the major aim is to create awareness among school children about Intellectual Property rights and make them understand the in-depth concept of every property. "

At this stage, the data gathered from Empathize *(Refer to Fig. 1.1 & 1.2)* is condensed into a clear issue description. The problem with the already existing sources is that there are only E-books, Books, Educational videos regarding IPR, etc. The issues that they were facing with books were that they were not able to understand a few complicated wordings, were time-consuming, and were not very interesting without virtual examples.

STAGE – 3: IDEATE

After analyzing the problems and suggestions given by everyone in the empathy and the define stage, a Conclusion was made to come up with the idea of an interactive game app. After considering the problem of time management and boredom the app was divided into different phases. These different phases focus on different ways in which students can learn. The type of interest for every student differs as some would like to watch videos and learn whereas others would like to read and understand many more. *(Refer to fig 1.3)*

Therefore In this app, there are different types, one makes the student recognize the IPR by analyzing the picture, and in the other, they have to answer with the help of the given clue. Some quizzes help them give a better understanding. When the students were asked questions about IPR, they were eager to know more about it. But they also said that they would prefer reading about real-life situations of the different ways Intellectual properties were obtained. Therefore few parts were added where the students would be given a prose of the real-life scenario that happened while getting the IPR, would be asked questions based on the prose, and would try all the games out of interest.

It also has a creative corner that makes the students note down their ideas for patents, copyrights, trademarks, trade secrets, geographical indications, etc. Therefore they won't lose the ideas and can enhance them to better ideas later. The dashboard also has an analysis box that analyses the student's performance and intimates the level of understanding of each topic and subtopic.

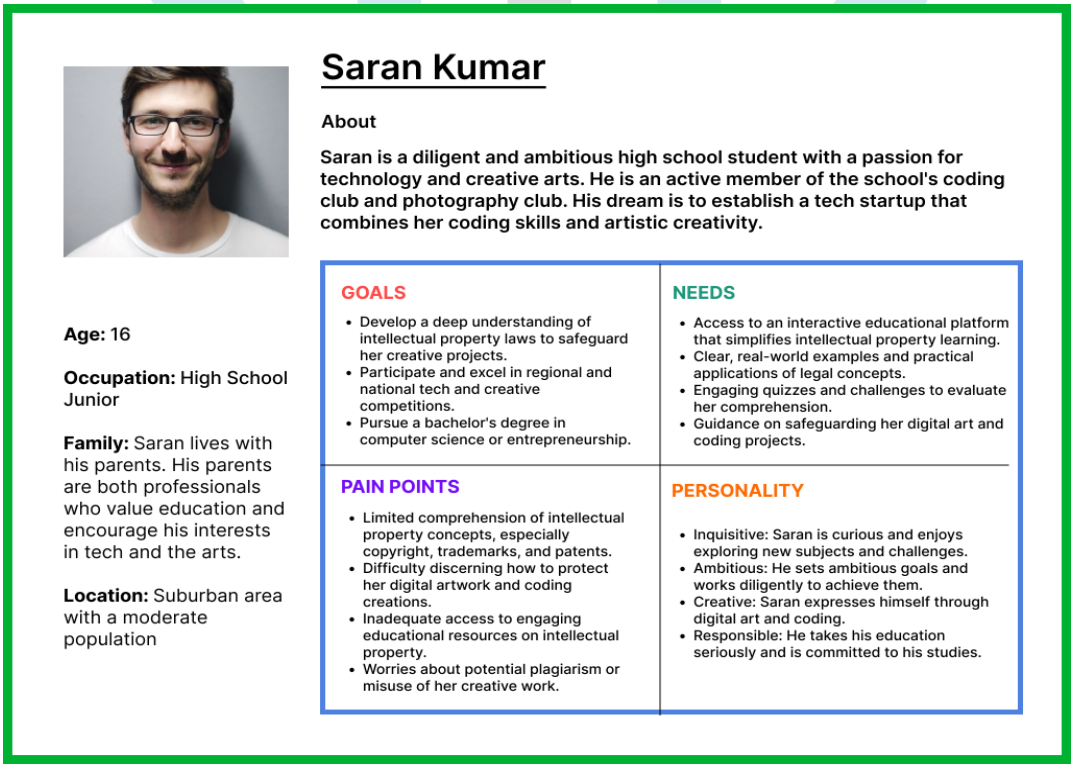


Figure 1.1 User Persona

Figure 1.2 Empathy Map

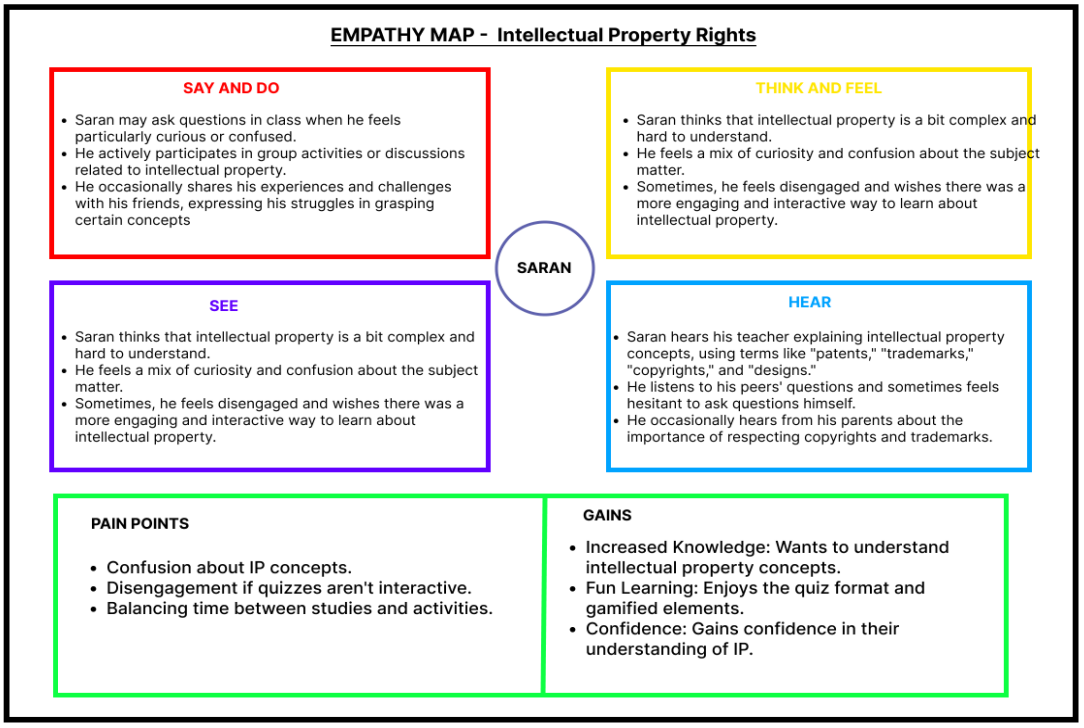


Figure 1.3 Customer Journey Map

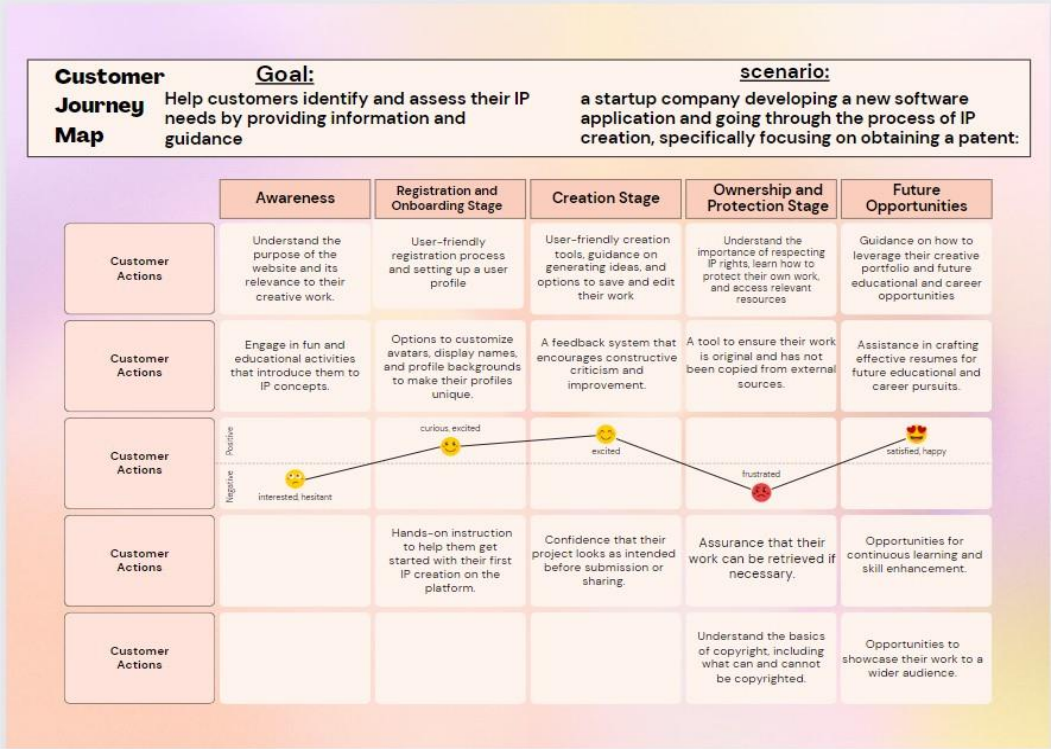
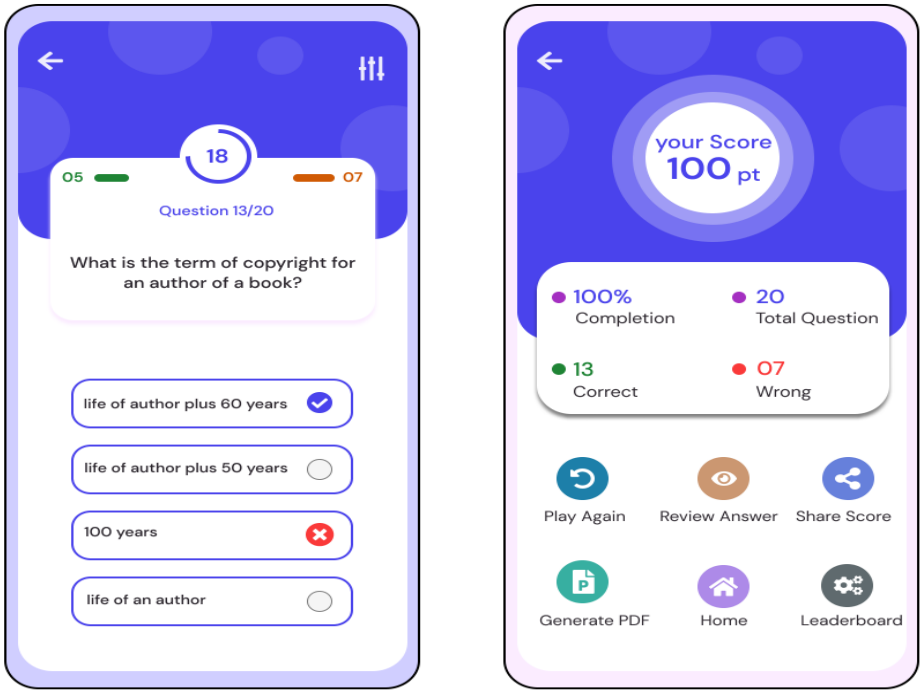


Figure 1.4 UI of the application



STAGE – 4: PROTOTYPE

After analyzing the ideate stage and making decisions on what to do, a low-fidelity model was designed. It was designed in such a way that the user logs in to the app with the necessary details such as the name, age, gender, and previous knowledge about the IPR which is known by the sort of simple quiz that is kept in the beginning. Then the user is redirected to the dashboard where there will be many games like the one with the pictorial representation, real-life story, quizzes, study material, the creative corner, and so many other games.

Once the user enters the interested topic then he/she can learn it via reading or a video according to their interest. Then after the learning process is done they can move on to the game and attempt specialized topic quizzes where they come to know their understanding level and know where to improve. There are also riddle-based games that not only make children understand the IPR but will also unleash their thinking skills differently.

After this, there will be a separate option called the scorecard and analysis (Refer to fig 1.4) where they will get a detailed analysis of the test taken and that will help them get stronger in the topic. This scorecard will also give where they are weak and tell them to improve at that particular place.

STAGE – 5: TEST

In this stage, The medium-fidelity model was put to the test and before the users played with it, they were asked a few questions regarding intellectual property rights. After the children stopped playing they were asked questions related to the IPR that found that there was a slight improvement of time within the short period that we gave them. When parents were asked about their children playing with this app they were satisfied and very happy that their children were learning something through the form of the game and would take actions and further steps to move forward towards achieving something that they learned through the app.

By asking a few public reviews regarding this it was found that there were also a few more suggestions for the app regarding its features that were given. Teachers were also satisfied with the medium-fidelity model and asked their students what they learned from it and in what way it was helpful. We made all ideas of what the users had in mind when they were asked about IPR.

V. CONCLUSION

The Intellectual property rights awareness game app satisfies the user needs in such a way that the users develop a confident amount of knowledge in the types of Intellectual property and gain confidence in the classifications. Students gave their concern about the points because of which the amount of concentration becomes less. This game app is interactive and user-friendly and helps the user develop ideas in such a way that they can enhance their ideas in the

future. It has provision for many games such that students of a variety of interests can access the game and gain adequate knowledge from the app.

VI. FUTURE SCOPE

Expanding the Intellectual Property Rights awareness game app involves a multi-faceted approach. Its evolution will span a wide geographical reach, fostering deeper knowledge and understanding. Future enhancements will encompass the inclusion of major national laws, engaging a global audience in a more comprehensive understanding of intellectual property rights. This growth will catalyze a more extensive and nuanced grasp of the subject, catering to diverse audiences while integrating pivotal legal frameworks across various nations.

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