

## Developing Simple Android Applications On Websites With MIT App Inventor For Students Of SMAN 4 Bogor City

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### *Abstract*

*SMAN 4 Bogor is high school under the supervision of the Ministry of Education and Culture in the South Bogor sub-district, Bogor city. Located 3 km from zero point Bogor city. This paper presents a workshop on Developing Simple Android Applications Based on Websites with MIT App Inventor conducted for students of SMAN 4 Kota Bogor by lecturers from the Faculty of Computer Science, Information Systems Department, Institut Bisnis Informatika Kosgoro. The workshop aimed to equip students with the skills to create Android applications, understand coding workflows, and conduct application testing. The hands-on training allowed students to apply their knowledge in developing simple everyday applications. The results indicate that students enjoyed the Android, computer, and website-based learning approach, finding it easier to grasp the subject matter. Additionally, there was a noticeable increase in their knowledge of information technology. This was evidenced by their increased engagement and comprehensive understanding during technology-based learning sessions. Students were able to develop simple applications for daily use, demonstrating the workshop's effectiveness in enhancing their technological proficiency.*

*Keywords: Android, Web Based, Application, MIT Appinventor and High School.*

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### **I. INTRODUCTION**

Education is an academic process that aims to improve cultural, moral, religious, social and cultural values while preparing students to be able to face various challenges in the process of life. In education, there is an organized and continuous communication process to foster learning activities in learners so that learners can develop their abilities in finding, processing and evaluating various information and knowledge to then contribute to finding solutions to existing problems and actively participate in society. In the conventional education system, the method used is through face-to-face meetings between teachers and students. In other words, teachers and students are in the same room at the same time to communicate and interact with each other. Distance education is institutional-based formal education where students and instructors are in separate locations so that it requires an interactive telecommunications system to connect the two and the various resources needed therein. Electronic learning (e-learning) or online learning (online) is part of distance education which specifically combines electronic technology and internet-based technology. The advances that occur in the world of communication and information technology give rise to new opportunities and challenges in the world of education.

New opportunities that are emerging include wider access to richer multimedia content, and the development of new learning methods that are no longer limited by time and space. On the other hand, technological advances with various digital innovations that continue to develop also present new challenges for education providers to continue to adapt educational infrastructure to this new technology. SMAN 4 Bogor is a Primary and High School located in Bogor City which carries out learning for teenagers both offline and online if there are assignments that can be done at home. Providing distance education cannot be separated from the use of technology. This is because in distance education there is no direct contact between teachers and students. The communication process between the two is carried out through the use of communication and information technology. However, face-to-face meetings can still be held with limited frequency. Communication and information technologies that are widely used in distance education are

computers and the internet. The use of computers and the internet provides students with the opportunity to be able to access teaching materials which have also been packaged in digital form anywhere and at any time.

By using computers and the internet, teachers and students can interact using electronic mail applications, video conferences, or online discussion forums. There are many types of applications that support online learning technology, including those commonly used by the public, namely Google Classroom, Google Meet and Zoom Cloud Meeting. This application is an application that can be used to facilitate independent learning from home by teachers and students. Teachers can take advantage of various features in the video conference application to interact with students, so this zoom application can really help two-way communication between teachers and students. In connection with this and in order to realize one of the Tri Dharmas of Higher Education, namely community service, the Information Systems study program will propose a training program for students regarding the Workshop on Making Simple Website-Based Android Applications with MIT AppInventor for Students of SMAN 4 Kota Bogor. The aim of this training is to provide knowledge to further develop in terms of information technology.

## II. RESULTS AND DISCUSSION

Based on the results of observations and interviews conducted by the PKM team with the School, the following is the identity, vision and mission and location of partners.

### 2.1 History, Facility, Place and Time of Implementation

State High School 4, Bogor City is a high school established in the South Bogor sub-district, Bogor city. Located 3 km from zero point Bogor city. In its history, SMA Negeri 4 Bogor City and other schools throughout Indonesia which were established in the New Order era to the Reformation era, there have been changes in school naming from time to time in accordance with changes in policy and curriculum in Indonesia, including: SMA Negeri IV Kotamadya Dati II Bogor (1981-1982), SMA Negeri 4 Kotamadya Dati II Bogor (1982-1994), SMU/SLTA Negeri 4 Kotamadya Dati II Bogor (1994-1999), SMU/SLTA Negeri 4 Kota Bogor (1999-2004), SMA Negeri 4 Kota Bogor (2004-Now). SMA Negeri 4 Bogor has various facilities to support teaching and learning activities. These facilities include: 27 Classrooms, Teacher's room, UKS room, TU room, Student Cooperative, Laboratory, Biology lab, Physics Laboratory, Computer lab, Principal's office, Healthy Canteen, Student toilets/WCs, Field, Ceremony, Parking, Volleyball, Basketball and Futsal, Library, Art Gallery, School cooperative, BP/BK (Guidance Counseling) Room, Al-Muttaqien Mosque Free Hotspot Internet.



**Fig 1.** SMAN 4 Bogor location

The activity was carried out for a day with each presenter explaining the material program in front of high school students. According to agreement between schools service implementation team and SMAN 4 Bogor City, activities carried out at SMAN 4 Bogor Auditorium, Jl. Dreded No. 36, Empang, Kec. Bogor Tue., Bogor City, West Java 16132, on Monday, May 20, 2022, 08.00 to 13.00. Meanwhile, the distance from the PKM location from the IBI-Kosgoro 1957 Campus to SMAN 4 Bogor is 46 KM.

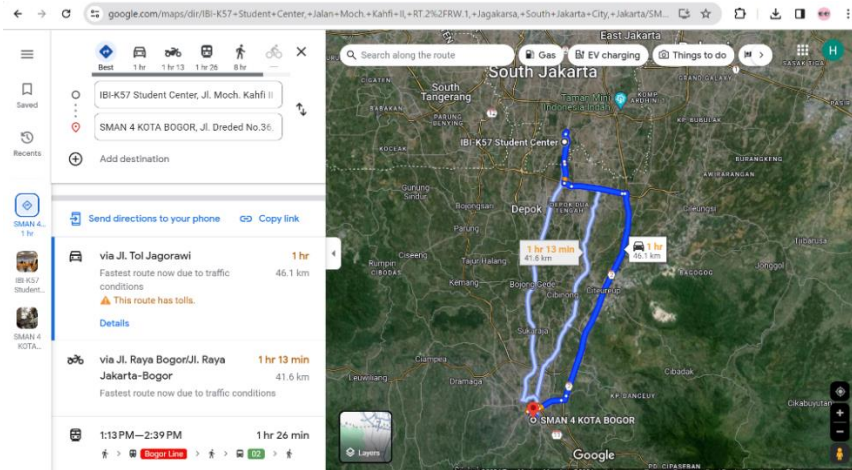


Fig 2. Location Route from IBI-K57 Campus to SMAN 4 Bogor

Table 1. Schedule of Activities from IBI-K57 Campus to SMAN 4 Bogor

No	Information	2024		
		Mar	Apr	May
1	Preliminary Observations	V		
2	PKM Activity Planning	V		
3	Division of PKM Team	V		
4	Coordination with School	V		
5	Proposal Preparation Meeting	V		
6	Implementation of PKM		V	
7	Evaluation and Preparation of Final Report			V

2.2 Implementation Method

Community service event by the Lecturer Team of the Information Systems Study Program, Faculty of Computer Science Kosgoro Business Informatics Institute 1957, The method used in this research is qualitative, namely by directly observing the object under study produces data in the form of a series of descriptive explanations of the objects observed. There are several stages used, including the preparation stage, observation stage, monitoring and evaluation The next stage, after the monitoring and evaluation stage, was carried out by several student representatives selected for the interview stage regarding the results of implementation and understanding obtained by students during implementation of community service activities. This program is practical by providing computer training to students. The output of the training program is in the form of tutorials on using website-based applications which will be given to students. Students will be given exercises to practice computers. The next program development from PKM is making presentations using online-based applications, creating multimedia and so on.

2.1.1 Preparation Stage

1. Identify the Problem

The preparation stage for community service begins with identifying problems or needs that exist in the community. In this context, surveys and interviews were conducted with the Principal of SMAN 4 Bogor City to understand the problems or needs to be solved. The results of this process show that there is a need to increase students' understanding of information technology, especially in the development of simple Android applications.

2. Goal Determination

After identifying the problem, the objectives of the service program are set clearly and specifically. The main objective of this program is to provide training to students at SMAN 4 Kota Bogor in creating simple website-based Android applications using MIT App Inventor. Additional goals include improving coding skills and understanding of application development workflows.

### 3. *Preparation of Proposals and Implementation Plans*

The next stage is preparing the PKM proposal and implementation planning. Proposals are prepared to describe program details, including objectives, methods, and schedule of activities. The implementation plan includes the division of tasks and roles of the IBI Kosgoro 1957 lecturer and student team, as well as scheduling activities to be carried out on May 20 2024 in the SMAN 4 school auditorium, Bogor City.

#### 2.1.2 **Implementation Stage**

##### 1. *Implementation of Training*

Training on creating website-based Android applications with MIT App Inventor was carried out according to plan. This training took place offline in the auditorium of SMAN 4 Bogor City. In this training, students are introduced to the basics of Android application development, coding flow, and the application testing process.

##### 2. *Organizing the PKM Team*

The PKM team is well organized, with a clear division of tasks and roles between team members. IBI Kosgoro 1957 lecturers and students are responsible for various aspects of training, including delivery of material and direct practical assistance. Good coordination among team members ensures smooth implementation of activities.

##### 3. *Interaction and Discussion with Participants*

Direct interaction with students is carried out through discussion and question and answer sessions. Students are given the opportunity to ask questions and discuss the material presented, as well as receive direct guidance in the practice of creating applications. It aims to ensure a comprehensive understanding and practical application of the material taught.

##### 4. *Documentation and Reporting*

The final stage of implementation is documentation and reporting of activity results. The entire training process, achievements and learning outcomes are well documented. The final report is prepared to describe the course of activities, results achieved, and lessons learned.

#### 2.1.3 **Evaluation Stage**

Based on the results of in-depth interviews with Principals, Teachers and Students, participants were enthusiastic and very happy with the method the material that had been shared gave them something new and valuable experience. for the next stage of education. Students are happy with innovation and new, more modern things with the use of technology, sophisticated ways of learning, because they can increase their knowledge as well as increase their experience of trying to learn in accordance with existing developments.

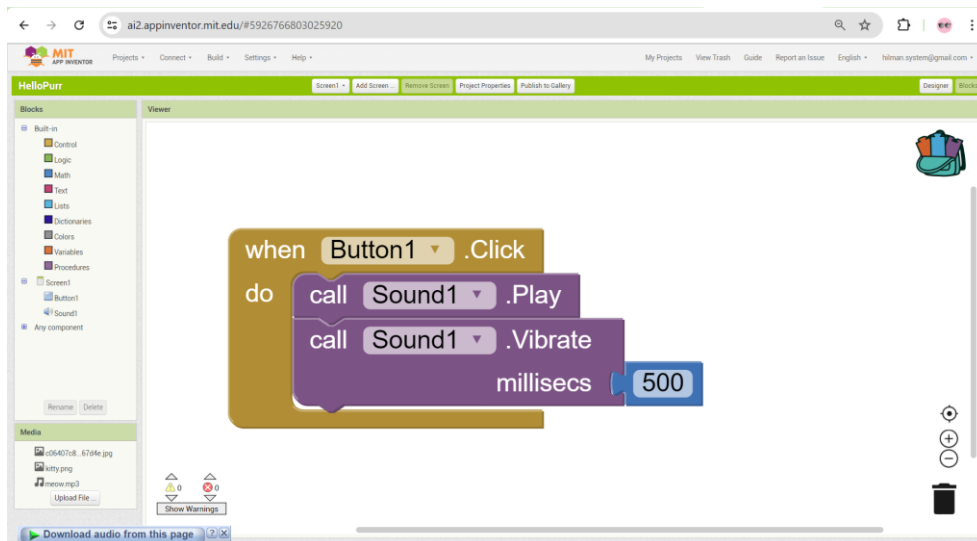
### 2.2 **Discussion**

#### 2.2.1 **Understanding MIT APP Inventor**

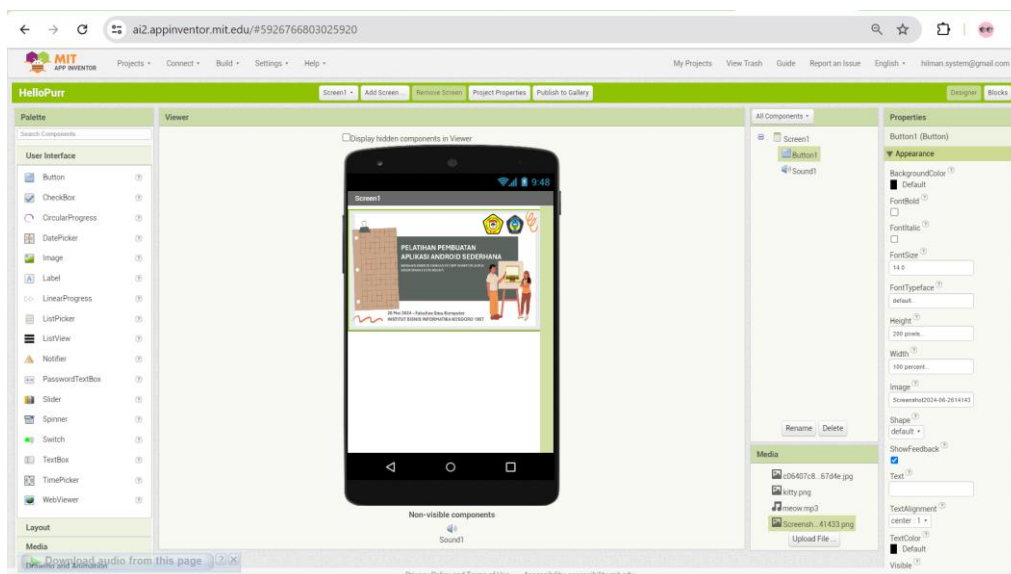
MIT App Inventor is a visual app development platform designed to allow beginners to easily create Android mobile apps without needing to have in-depth programming knowledge. Below are some points that can be learned from using MIT App Inventor:

1. **Understanding Mobile Application Concepts:** Through MIT App Inventor, student will learn the basics of how a mobile application works, including the basic structure, workflow, and features that applications generally have.
2. **User Interface Design:** student will learn about user interface (UI/UX) design, including how to add buttons, images, text, and other elements to application to make it attractive and easy for users to use.
3. **Visual Programming:** App Inventor uses a visual programming paradigm, where student build applications by connecting "blocks" of logic together. Student learn how to use these blocks to create the desired functionality and behavior in your applications.
4. **Data Management:** student will learn how to manage data in your applications, including using variables to store information, manipulating strings and numbers, and connecting your applications with external data sources, such as online databases or APIs.
5. **Hardware Interaction:** App Inventor allows student to take advantage of phone's hardware features, such as motion sensors, GPS location, camera, and more. student will learn how to use the appropriate blocks to access and control these features.

6. **Testing and Debugging:** During the application creation process, student will learn how to test application on various devices, find and fix errors (debugging), and iterate to improve the quality of the application.
7. **Creativity and Innovation Development:** App Inventor provides startups with an opportunity to express their creative ideas and turn into functional apps. This can broaden horizons about the technology's potential and encourage experimentation with new ideas.
8. **Problem Solving Skills:** In developing applications, student will often be faced with problems that require solving. The process of finding solutions to these problems will help you develop problem solving skills that are useful in a variety of contexts.
9. **Collaborative Project Development:** App Inventor enables collaboration between users, allowing teams to work together on application development. This can help you understand teamwork dynamics and appreciate individual contributions to a project.
10. **Introduction to the World of App Development:** For many users, the experience with MIT App Inventor can be an entry point into the broader world of app development. This may encourage interest in learning more advanced programming languages and deeper development concepts in the future.



**Fig 3.** Program blocks MIT Appinventor



**Fig 4.** Designer View Android Application MIT Appinventor

### 2.3 Documentation Activity



### III. CONCLUSION

Based on the results of in-depth interviews with principals, teachers, and students, the community service program (PKM) was successfully implemented, and the students of SMAN 4 Kota Bogor learned key points from using the MIT App Inventor. The participants were enthusiastic and very happy with the method and material provided, as it gave them new and valuable experiences for the next stage of their education. Students appreciated the innovation and modernity brought by the use of advanced technology, which enhanced their knowledge and provided them with practical learning experiences in line with current developments.

### IV. ACKNOWLEDGMENTS

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