



MY HACK + ImpactTek

The First Muslim Hackathon for Social Good

ImpactTek Mentorship for Muslim Youth Hackers

- AFTER completing this short, hands-on, introductory workshop – approximately 2 hours – the learners will be able to:
 - Extend this app with their own ideas. And/or,
 - Start converting their ideas into a new APP of their own!
- Learners would have learned enough to put their own creative and innovative app ideas – for the greater social good – into a working mobile APP!
- They can then participate in the MY HACK: The first Muslim hackathon for social good.
- During the next 2 hours of learning, they would be able to visually code, and innovate with fellow hackers.
- Any Questions, please email: MSabri@ImpactTek.onmicrosoft.com

ImpactTek Mentorship for Muslim Youth Hackers

- Using a “NO-Code / LOW-Code” App Development environment to:
 - Introduce Middle / High School students to DEVELOPING their own Apps!
- Using a completely Graphical User Interface (GUI) based App Development environment, students who have NEVER before seen a computer program – but have an innovative idea for an APP, hopefully for a greater social good – CAN start
 - Building, Testing and Running their first app in LESS than an hour!
- ImpactTek instructor, M. Anwar Sabri, will offer an introductory short workshop (~ 2 hours) to get the hackers started on this journey.

ImpactTek Mentorship for Muslim Youth Hackers

- ImpactTek workshop will be using a FREE software for making mobile apps, called “**MIT App Inventor**” which is a web application Integrated Development Environment (IDE) originally created by Google, and now maintained by the Massachusetts Institute of Technology (MIT) Media Lab and MIT Computer Science and Artificial Intelligence Laboratory.
- This starter workshop will help young students to explore key programming concepts by VISUALLY developing their App through “drag-and-drop” blocks of code on the GUI.
- The App Inventor empowers non-programmers to transform their ideas into real apps for mobile phones and tablets.

ImpactTek Mentorship for Muslim Youth Hackers

- Many young people around the world are using MIT App Inventor to create apps to positively impact their communities for social good:
 - Kids in California developed an app that allows users to record and report graffiti and then organize clean-up events in their community.
 - Middle-school students in North Dakota created an app to encourage more recycling in their community.
 - Middle-school girls in Texas designed an app that uses the GPS to guide visually impaired students around their school.
 - Teen-agers in Nigeria built an app that uses location sensing to help traffic police catch offenders!
 - Young women in Europe designed a crowdsourcing app to help residents find safe drinking water.
 - A middle-school boy in India developed an app to help parents locate their children's school bus and check if their child is on the bus or not!

What Will Be Covered in the ImpactTek workshop?

- ImpactTek workshop offering will cover the following:
- Getting Started With the MIT App Inventor:
 - Set up an App Inventor Account to start developing an App and save it on the Cloud.



Active Users today: 121.0K	Active Users this week: 386.1K	Active Users this month: 1.2M	Registered Users: 14.9M	Countries: 195	Apps Built: 67.8M
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WHAT IS APP INVENTOR?

- App Inventor is a FREE, VISUAL Programming Environment originally developed by Google and now maintained by the MIT
- Web site: <https://appinventor.mit.edu/>
- It EMPOWERS “normal” people to create software for their mobile phones / tablets rather than simply use those devices
- In traditional programming environments – aka IDE’s or Integrated Development Environments – you need to type the actual code to develop SW in a programming language like Java or Python
- But, the App Inventor lets you develop (or create) fully-functional apps relatively quickly by just “Dragging and Dropping” blocks of code onto screen rather than typing them – hence low-code/no-code

WHAT IS APP INVENTOR?

- This VISUAL approach makes it extremely simple for ANYONE to create and publish a functioning app for a smartphone in under an hour!
- You can also use App Inventor to program more complex apps with high-tech mobile computing features in significantly less time than using traditional, text-based programming environments
- Best of all, App Inventor blocks of code incorporate the SAME programming logic that is used in writing SW programs in traditional IDE's
- Which means that the programming concepts learned here will also be helpful in your future career as a developer / programmer

GETTING STARTED WITH APP INVENTOR:

- BEFORE you can start designing an app, you'll need to set up an App Inventor account
- Having an App Inventor account lets you work on your apps on the web and save them in the cloud
- You'll also be able to live-test your projects, meaning that you can see and test all the changes as you work
- To set up an account, go to the App Inventor's home page at URL:
 - <https://appinventor.mit.edu/>
- To learn more about the App Inventor, go to the following url:
 - <https://appinventor.mit.edu/about-us>

Building An APP With the MIT App Inventor:

1. Planning / Designing A New APP:

- a. Every App starts with a GOAL (purpose) – a problem to solve.
- b. Once the goal has been identified, we need to break the app design into its components:
 - i. user interface design and
 - ii. behaviors (how to react / interact with the user and other outside stimuli or events)
- c. Breaking an app into smaller components makes it easy to tackle the creation of an app rather than trying to accomplish all at once
- d. This process of “dividing-and-conquering” a big problem is also called decomposition, which, in turn, will help you in outlining the precise steps – or the algorithm – necessary to develop each part of the app BEFORE you actually start coding or programming

Building An APP With the MIT App Inventor:

2. Decomposition and Algorithms:

- a. These detailed, step-by-step instructions -- called ALGORITHMS in Computer Science terminology -- are the most important connection between human understanding of the problem and how to tell a computer to perform those tasks to achieve the goals.
- b. You'll also need to IDENTIFY the elements and features that your app would need to perform properly – allowing users to interact with it as you intend
 - i. Will your app let users take videos, send text messages, or sense their physical locations?
 - ii. Will a user need to click a button, type some text, or select from a drop-down list of options to complete the tasks that you have identified for your app?
- c. These are the kinds of questions that would help you in determining the features that your app would need to have

Building An APP With the MIT App Inventor:

2. Decomposition and Algorithms:

- d. Once you know what you need to include in your APP, you can then start laying down its GUI (Graphical User Interface) elements
- e. These are the parts or features of the app that the users of your app would be able to see AND interact with on the screen
- f. Your app should be EASY to use and understand for its users – that is, your app should use intuitive and common sense for its users to work with
- g. To keep users' attention – so that they do not get frustrated and stop using your app because they could not figure out how to use it! – you might add pictures, color-coded sections, music or audible instructions, and different text styles, sizes, fonts, and colors to help your users intuitively use them

Building An APP With the MIT App Inventor:

3. Laying Out Your APP in the MIT App Inventor's "Designer Window"
 - a. Once you have a plan, you can start laying out the necessary components in the "Designer Window" of the App Inventor
 - b. In App Inventor, components consist of all visible, as well as non-visible elements that can be used in an app
 - c. The elements can set the look and feel of your app (visible components) and add exciting functionality (non-visible)
 - d. All components in an app have properties, or characteristics, that you can manipulate using the blocks of code
 - e. These components belong to different categories, such as:
 - i. Media and social categories – add speech recognition and texting, and
 - ii. Other components, including video recording, location sensing, text-to-speech, animation, drawing, dragging, sound, picture taking and much more!

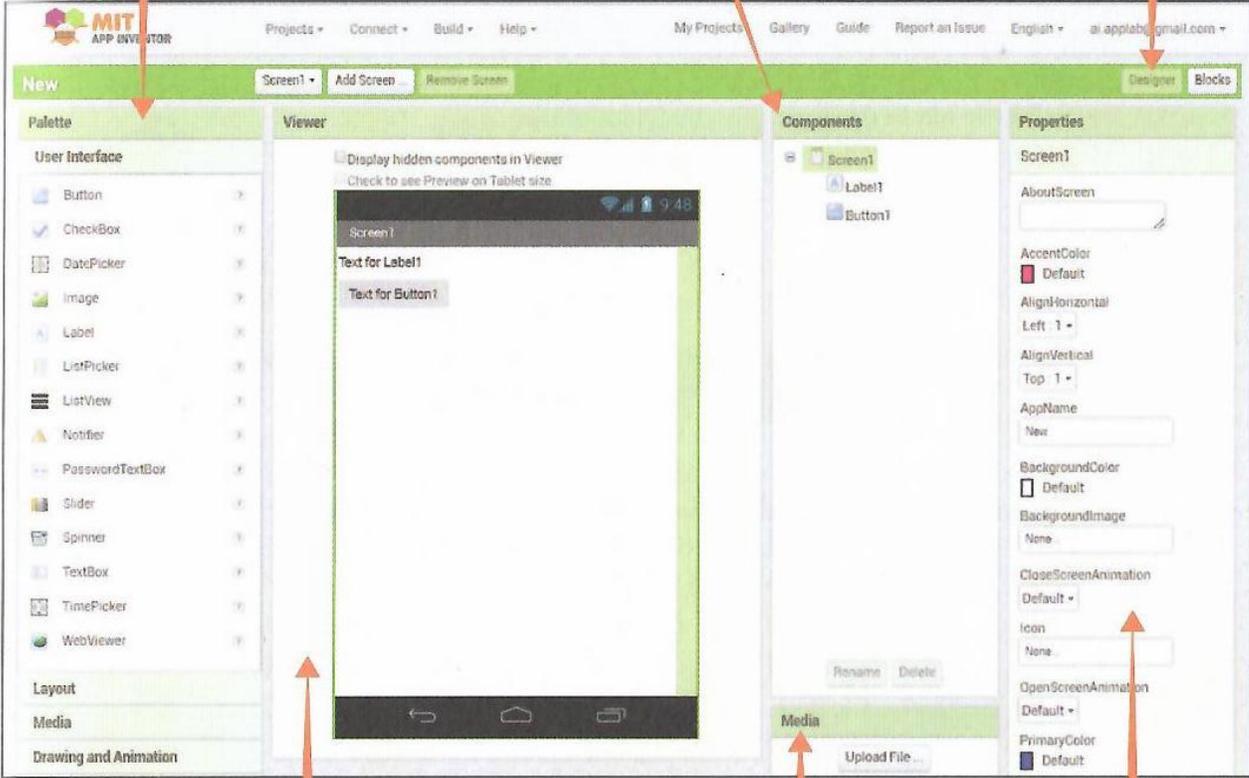
Building An APP With the MIT App Inventor:

3. Laying Out Your APP in the MIT App Inventor's "Designer Window"

Components pane: See the list of components you've added to your app.

Palette pane: Look in the drawers for components and drag them to the Viewer pane to add to your app.

Designer button: Click this button from any window to go to the Designer.



The screenshot shows the MIT App Inventor Designer interface. At the top, there's a navigation bar with 'New', 'Screen1', 'Add Screen', and 'Remove Screen' buttons. Below this are four main panes: 'Palette' (left), 'Viewer' (center), 'Components' (right), and 'Properties' (far right). The 'Palette' pane has drawers for 'User Interface', 'Layout', 'Media', and 'Drawing and Animation'. The 'Viewer' pane shows a mobile app preview with a label and a button. The 'Components' pane lists 'Screen1', 'Label1', and 'Button1'. The 'Properties' pane shows settings for 'Screen1', including 'AboutScreen', 'AccentColor', 'AlignHorizontal', 'AlignVertical', 'AppName', 'BackgroundColor', 'BackgroundImage', 'CloseScreenAnimation', 'Icon', 'OpenScreenAnimation', and 'PrimaryColor'. A 'Media' pane is at the bottom with 'Rename', 'Delete', and 'Upload File...' buttons. Red arrows point from text annotations to these various elements.

Viewer pane: Drag components here from the Palette pane to add them to your app and see how they'll look on your app's screen.

Media pane: See the list of picture, sound, and other media files you've uploaded to your app.

Properties pane: Click a component and then change its properties here.

Building An APP With the MIT App Inventor:

4. (Visually!) Programming Your APP in the MIT App Inventor's "Blocks Editor"
 - a. Once you have placed all the necessary components in your app, you would then use the App Inventor's "Blocks Editor" to add the logic into the app
 - b. This is the "programming" part of an app, but done VISUALLY in the App Inventor – hence no-code / low-code
 - c. The Blocks Editor window consists of the Blocks pane on the left and the Viewer pane on the right
 - d. The Blocks pane contains "drawers" for both the
 - i. Built-in blocks to program the app's general behaviors, as well as the
 - ii. Components-specific blocks, which direct particular actions for each component
 - e. To tell your app what to do, simply drag blocks from the drawers in to the Blocks pane and snap them together in the Viewer

Building An APP With the MIT App Inventor:

4. (Visually!) Programming Your APP in the MIT App Inventor's "Blocks Editor"

Viewer pane: Drag blocks from the Blocks pane drawers and snap them together here to program your app's behavior.

Blocks button: Click this button from any window to go to the Blocks Editor.

Built-in blocks drawers: Click and drag blocks from these drawers to the Viewer pane to control the app's general behavior.

Component-specific blocks drawers: Click and drag blocks from these drawers to the Viewer pane to set the behavior for the specific components you added to your app in the Designer.

What Will Be Covered in the ImpactTek workshop?

- The workshop will also include a hands-on practice for the learners by Building The “Hi, World” App With the MIT App Inventor:
 1. Learners will be treated to a fully-guided hands-on practice to build a real App which will send an SMS (text) message as follows:
 - a. When a user clicks the “message” button on the App’s screen, s/he will be able to say the text message vocally
 - b. The app will capture the user’s audio message and convert it to text
 - c. Then the user will be able to open his/her phonebook on the mobile phone’s contact list and select a recipient for the message
 - d. When the user clicks /taps on the “Text” button, the message converted by the speech-to-text function on the mobile phone would be sent to the selected recipient

What Would the
Finished App
Built in the
ImpactTek
workshop Look
Like?

The “Hi, World” APP will look like
the following image on a mobile
phone:

