



**JOI® SMART CLASSROOM
BY SNS NETWORK (M) SDN BHD**

Overview of Education

Towards 21st Century Learning Environment with JOI® Smart Classroom

In recent years, the education sector has seen a noticeable increase in educational standards, advancement and innovations. As the pace of change in the 21st century continues to increase, the world is becoming more interconnected and complex. Hence, a 21st century education must provide a holistic and quality education which empowers students to optimise their potential, thrive in the global workplace, and function productively in society. Schools and other educational institutions have begun to adopt modern teaching methods through interactive intelligent boards, projectors and smart notebooks and more. These technological updates are important to make the education system in becoming more interactive and effective.

JOI® Smart Classroom provides a flexible learning approach for different environment and settings. The effectiveness of the JOI® Smart Classroom lies on the use of sophisticated technological equipment, as well as the layout and the implementation of a more flexible learning environment which aims to produce a diverse array of activities in the classroom, either collaboratively or individually which emphasizes on the 21st century learning skills; communication, collaboration, critical thinking, and creativity.

Solution Overview

A Better Learning and Teaching Environment with JOI® Smart Classroom

A classroom has students with varied power of understanding and learning, and studying from notes and other materials becomes difficult for some students. But the use of JOI® devices eases the learning process for all students and promotes more interaction between teacher and student with more participation from both sides. JOI® Smart Classroom is adaptable to different classroom settings and equipment and thus, the solution is flexible to meet the needs of different teaching strategies and learning preferences whether in group settings or even one-on-one teaching. As a highly flexible digital learning platform that support various classroom settings and environments, the platform is unique and capable to be loaded with educational materials for students. JOI® Smart Classroom is flexible and do not compromise learning and teaching experience even in the condition of limited or without internet access.

The use of digital tools of instruction bring in an interactive environment to learning. Through JOI® Smart Classroom technology and system, information can be illustrated with the help of photos, maps, graphs, flowcharts and animated videos. This makes learning more attractive, interesting and easy to understand. It encourages the ability of students to learn and memorize the topic for a prolonged period of time. At the same time, the JOI interactive whiteboard helps teachers to deliver lectures more effectively by using the different projections in their presentation to explain the topic. Teachers can easily explain each and every part of the lesson with some special effects and graphic presentations. It makes a wonderful learning environment in the classroom. JOI® Smart Classroom provides better and dynamic ambiance to the student to learn in a smart way. Smart learning will always play a role in education and emerging technologies can facilitate superior learning with better retention.

Deriving Insights through Data Analytics on Joi® Smart Classroom Platform

Joi® Smart Classroom is the key enabler for the future of big data analytics. Real time data are retrieved from the integrated network of Joi® Smart Classroom and to be centralized in the School Server. The technology had made it possible to collect and analyse vast details about student performance and behaviour which enable educational institutions to glean useful insights from the rich ream of data in improving students' performance for academic success. On the other hand, data analytics can be used to enhance the teaching experience of the educators as well. The educators can better trace and take targeted actions to enrich the learning experience. It gives educators and students an edge in understanding where and how improvements can be made in the learning process by providing real-time feedback, and by enriching the learning experience.

Parents too, can learn on their children learning journey through the formal and periodic reporting mechanisms to understand their children’s individual academic performance to diagnose and address learning gaps. By combining the data from the analytic sources, data analytics can provide a solution for government’s ministry that aim to monitor the performance of schools more closely. It can also offer a wide array of functions on both the academic and administrative sides, from improving student performance and instructor effectiveness to managing student enrolment and budgeting strategically. The strategic use of data analysis in education will tremendously improve and address inequities in the current’s education system.

Learning Behaviour through Artificial Intelligence (AI) with JOI® Insights

Student learning behaviours analysis is another important application of Artificial Intelligence (AI) in this smart education solution by utilizing big data and AI to intelligently identify and analyse students’ learning pattern and behaviour apart from homework, exercises and exams. The AI-based system analyses videos, images, data statistics that are dynamically collected from various client applications to gain insights on each student learning behaviour to guide and form their learning model. Based on each student’s learning model, the system provides better personalized coaching and learning paths to improve students’ performance. Simultaneously, it guides teachers to better-design teaching. These data can also be analysed to help educators to optimize their pedagogical approach and the quality of the teaching objectives.

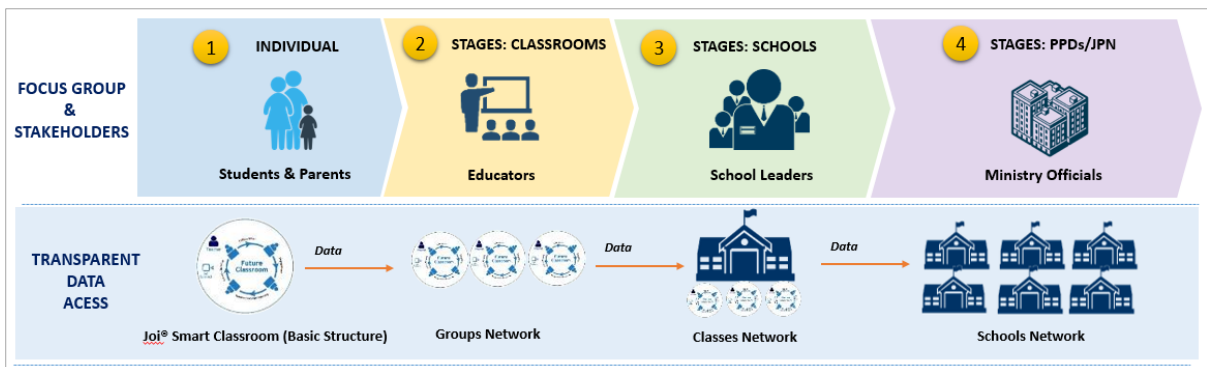
A Versatile, Sustainable and Scalable Long-term Impact Solutions

Implementing the right educational technology is important and crucial to keep the modern classroom moving forward. Adapting technologies from the industry leaders, the expansion and extended networks of JOI® Smart Classroom platform are scalable to integrate the future education needs including classroom digitization, global learning, extended classroom community, virtual reality in education, artificial intelligence in education, data analytics for improvement, just to name a few.

JOI® works with the latest technology, including JOI® laptops and devices, JOI® interactive whiteboards, JOI® charging station, JOI® connectivity devices which highly compatible with dozens of software programs and online resources for various subjects. JOI® Smart Classroom is suitable for all levels of students.

Customer Types and Potential Outcome

Key Capabilities and Benefits



Educators

Increases the focus on professional learning and growth, reducing teacher administrative workload through the use of technology. The ability for educators to be assisted by technology in the management of their classes means that they can spend less time pencil-pushing and more time gaining useful insights from their classroom AI tools to deliver higher standards of teaching. Reports and analytics from the platform provide greater support and accountability for improving student outcomes.

Students and Parents

Students are moulded to shift from information consumers to creative problem solvers through mutual space of learning, interacting, communicating and collaborating. At the same time, student's report generated from the platform helps in improving child's performance through personalized learning. Each stakeholder can easily access the information through client applications running on mobile phones, tablet and computers.

School Administrators

Real time data feeds, detail teaching and learning reports and analytics provide information that leads to effective school development for overall school improvement. Smart IOT devices such as cameras can be installed in classrooms to implement automatic sign-in based on face recognition. Individuals can be accurately identified for attendance statistics and thus improving management efficiency.

Education Ministry Officials

Data feeds from JOI® Smart Classroom over schools provide clarity to the ministry on the overview of education development which leads to high-quality digital education resources, promoting education equity and improving teaching quality. Through big data analytic and AI, students' learning pattern and behaviour can be collected and analysed. Insights derived will be able to help to curate personalized learning model to improve both teaching experience and learning outcomes. At the same time, the information will also be able to assist in various research and evaluation including assessment, curricular requirements and etc. and empowering the ministry to continuously improve the education system.

JOI® Smart Classroom - an Intel Architecture-Based Classroom Solution**Incorporating Intel Hardware and Software**

JOI® Smart Classroom solution consists of important components as describe as following:

- Student computing devices on Intel® based processor
- Interactive Whiteboard with OPS ready powered by Intel® Core i5 / i7 Processor
- Intel® vPro™ Platform
- Intel® Unite Solution
- High performance Intel® Xeon based servers
- Content Access Point as connectivity devices powered by Intel® Atom Processor
- Visual Data Devices based on Intel® Xeon based servers
- Intel® Distribution of OpenVINO™ toolkit

Student Devices:

Choosing the right education devices that are best for learning needs across range of ages and activities, enhances learning experience through educational technology. Joi® Smart classroom Solution is designed to

compatible with various form factor of computing devices powered by Intel's best-ever generation of core processors, supporting the needs of device performance that leads to meaningful learning experiences.

Educator Devices:

Joi® Interactive Whiteboard OPS solution based on Intel architecture powered by Intel® Core i5 or Core i7 Processor. Its remote management capability through the Intel® vPro™ Platform enable remote management for better manageability of the device. On the other hand, the Intel® Unite Solution promotes cost-effective collaboration, enabling screens sharing and other content using a variety of endpoint devices in the classroom environment. Technology can help educators create blended learning environments and leverage digital tools for formative and summative assessments, bringing new models for learning and teaching to classrooms.

Connectivity Devices:

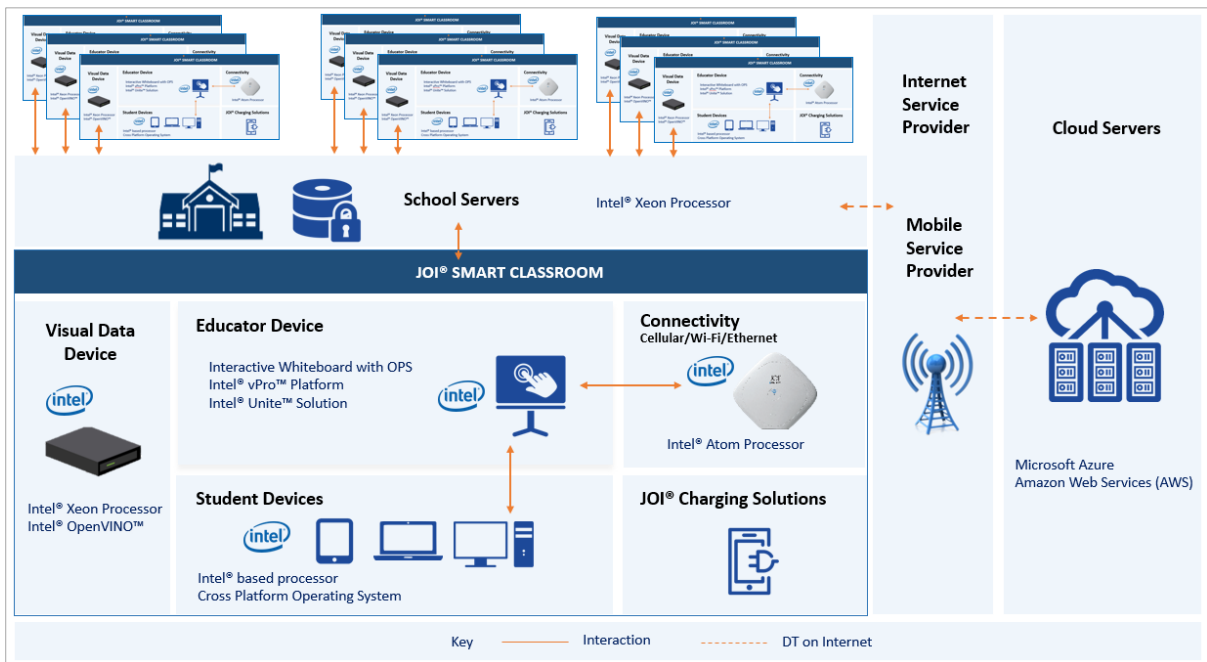
Taking the classroom digital is now easier than ever. JOI® Connect powered by Intel® processor is specifically designed to store, manage and distribute lesson contents wirelessly. It makes access to digital content easier than ever and it solves the challenge of low or no connectivity transforming the classroom experience. The device content management allows lesson to be created and stored in advance, thus allowing time saving and more better time utilization and focus on delivering lessons.

School Servers:

The right combination of cloud computing and on-premise school servers can be customized to keep learning environments supported and safe, no matter their location or internet connectivity. Intel® Xeon® scalable processors optimize interconnectivity with a focus on speed without compromising data security, at the same time optimizing learning experiences.

Visual Data Devices:

Student learning and behaviour data is dynamically collected and analyse to improve teaching and learning experience. With the convergence of scalable hardware and software solutions, the Intel® Distribution of OpenVINO™ toolkit will be able to boost the inference applications across multiple networks with high throughput and efficiency.



JOI® Smart Classroom as the Market Ready Offering

The uniqueness of JOI® Smart Classroom Solution



- **Cost Saving**

A realistic implementation cost for a Connected Classroom for Digital Learning.



- **Flexibility**

Standard platforms that delivery performance and manageability that easily integrates into current architecture for optimum flexibility.



- **Reliable Connectivity**

Students and Teacher can be virtually connected with or without the needs of Internet.

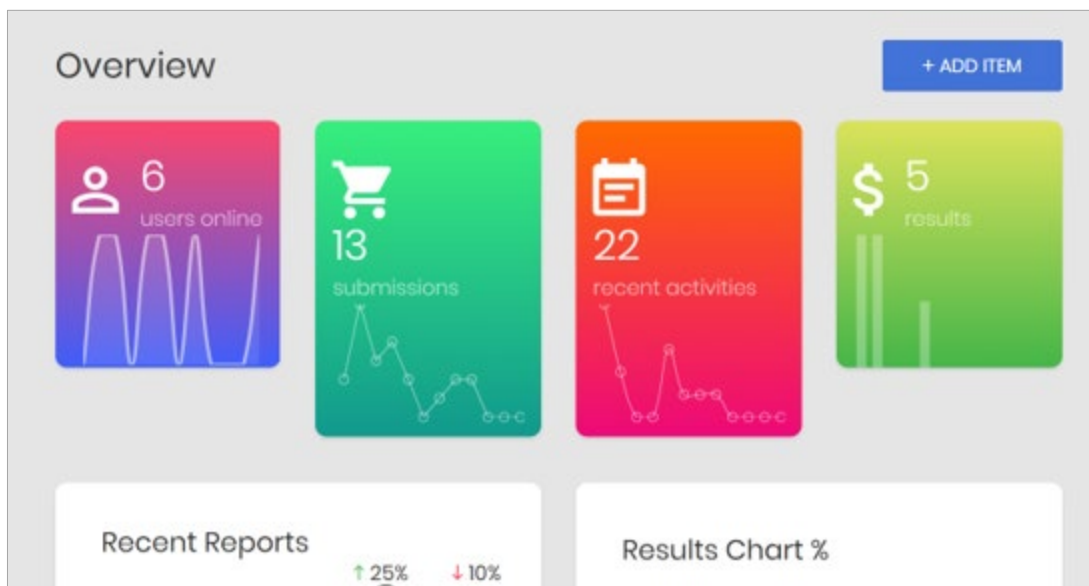


- **Security**

Provide safe and secure computing practices and proactively protecting students and teacher devices from exposure to malware.

Data Analytics and Artificial Intelligence through Joi® Insights

Dashboard View on Web Browser

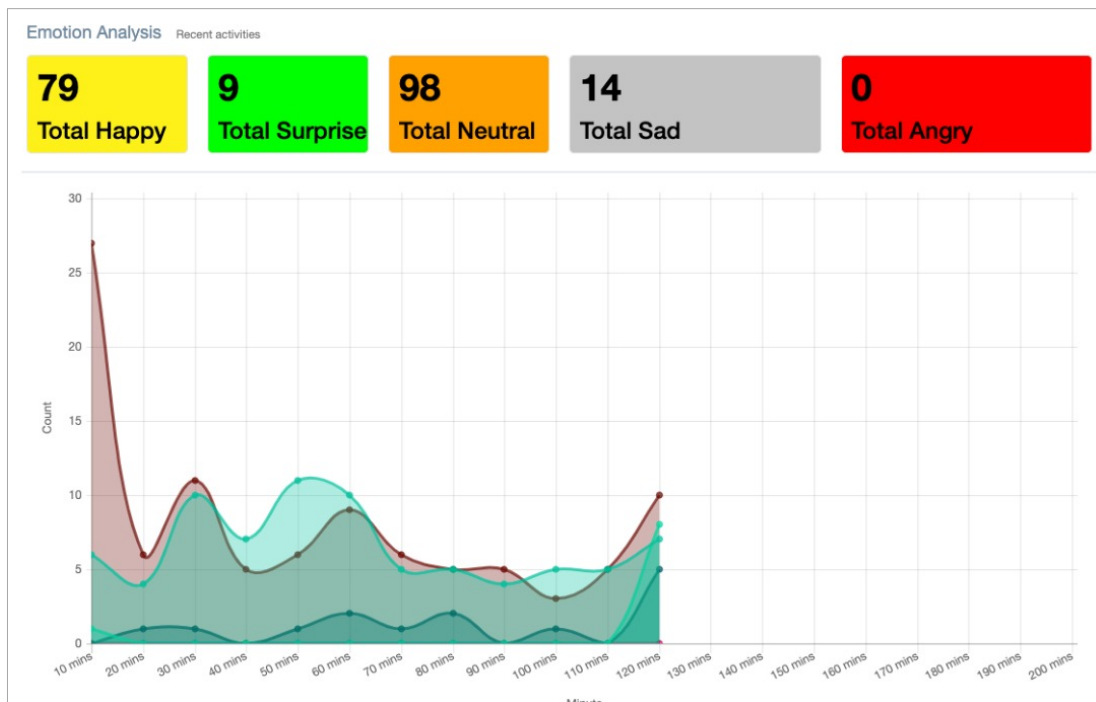


Realtime Assessment Results View

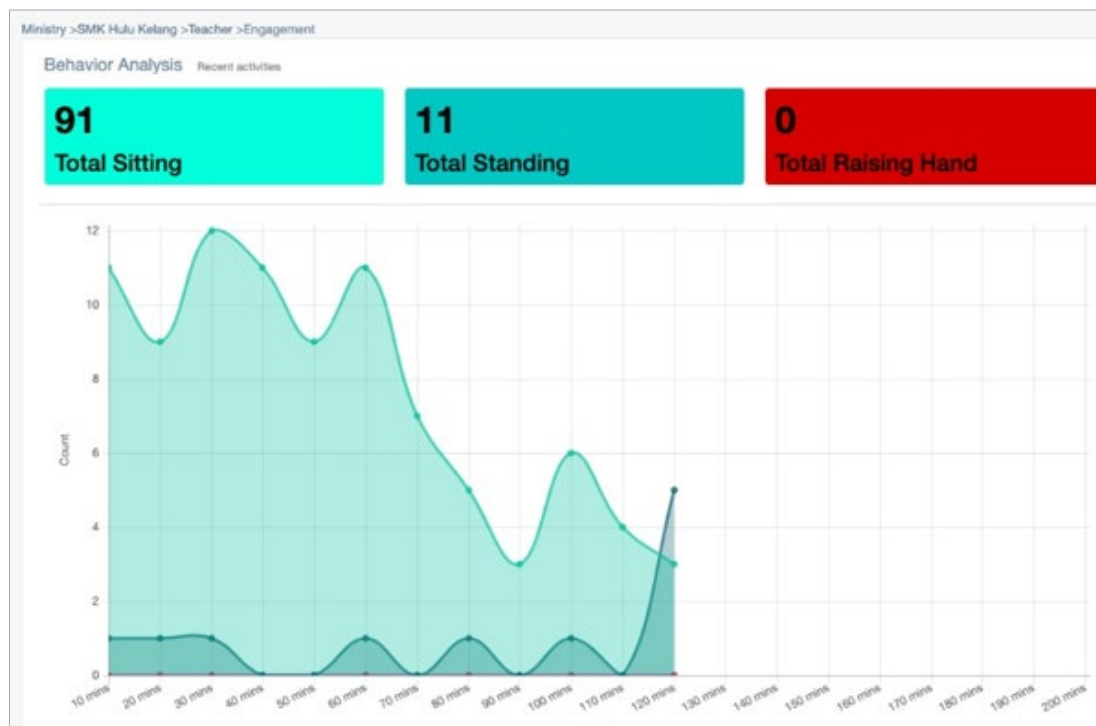
Realtime Attendance: Schedule

School	Class	Standard	Date	Time	Attendance
SMK Hulu Kelang	5 Sains 3	Standard 5	24/November/2019	17:37:29	2/6 Presents
SMK Hulu Kelang	5 Sains 3	Standard 5	18/November/2019	10:29:39	0/6 Presents
SMK Hulu Kelang	5 Sains 3	Standard 5	17/November/2019	13:18:00	2/6 Presents
SMK Hulu Kelang	5 Sains 3	Standard 5	17/November/2019	10:32:22	1/6 Presents
SMK Hulu Kelang	5 Sains 3	Standard 5	17/November/2019	08:38:00	2/6 Presents
SMK Hulu Kelang	5 Sains 3	Standard 5	17/November/2019	07:43:30	1/6 Presents
SMK Hulu Kelang	5 Sains 3	Standard 5	16/November/2019	18:36:20	0/3 Presents

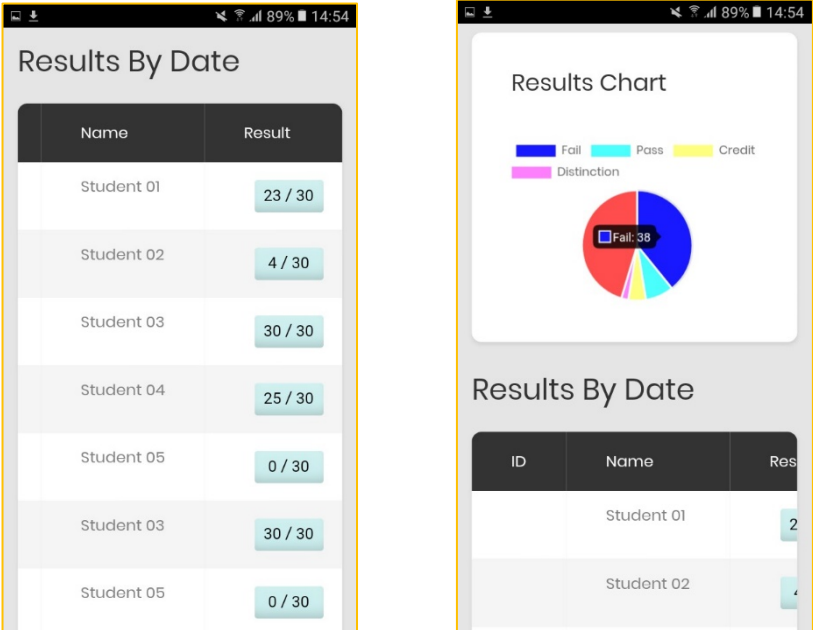
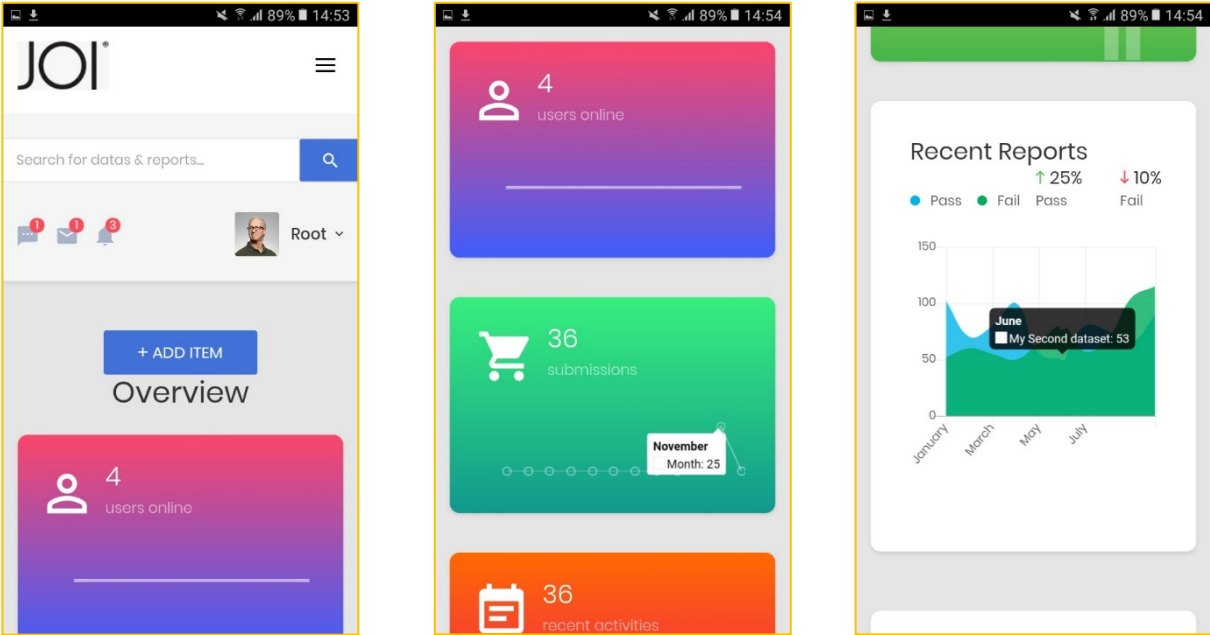
Student Engagement: Emotion Analysis



Student Engagement: Behaviour Analysis



Dashboard and Push Notification on Mobile Apps: Android & iOS



Implementation of JOI® Smart Classroom





