



# XD School Facility Booking System – Case Study Report

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*A community-driven digital solution to fund education*

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## **1.0 Background and Problem Statement**

This case study presents a real-world digital solution developed for XD School, an inclusive and gamified learning platform that supports underprivileged youth. The primary goal was to create a sustainable, easy-to-use system to raise USD 1,000 monthly by renting out school facilities, in order to provide essential items like uniforms and school supplies for 10 students.

The school has underutilized facilities available on weekends from 8 AM to 12 PM. To support the 2024 school year, they seek to generate consistent monthly income through a rental system that can operate with minimal administrative burden. This required a solution that is simple, intuitive, and fast to deploy.

## **3.0 Solution Overview**

### **3.1 Booking System (Google Form)**

A clean and mobile-friendly Google Form was designed to allow parents and community members to easily select a facility, input contact information, and submit a booking request. The form was embedded with pricing logic and connected to a QR code for broad accessibility.

### **3.2 Response Tracker (Google Sheets)**

The Google Form is linked to a real-time response tracker in Google Sheets. It includes columns to auto-calculate rental income based on the facility selected, as well as a manual status column (Pending / Confirmed / Declined). Conditional formatting improves visibility for the admin team.

### **3.3 Google Apps Script (Google Script)**

The system can optionally integrate with Google Apps Script to automate tasks like sending email confirmations or updating booking statuses. This adds operational efficiency without requiring new tools.

### 3.4 Promotional Poster and QR Code

A digital poster was created to drive awareness and engagement, especially on social platforms. The design features a child-friendly blue theme with clear facility options and rental prices. A scannable QR code directs users to the live booking form.

### 3.5 Social Media Campaign

A light social media plan was created, including four weeks of post ideas and caption templates. The campaign focuses on the message: 'Your booking supports 10 students.' This approach highlights social impact and invites the community to take part in education-focused giving.

## 4. Results & Testing

The system was successfully tested across devices and users. The booking workflow from form submission to revenue calculation functions smoothly. Screenshots and confirmation examples are included in the appendix. The system is now ready to launch with minimal support required.

## 5. Future Possibilities

While this solution was designed for quick deployment, it provides a strong foundation for future improvements. Here are several opportunities to expand the platform's capabilities:

- **Time Slot Booking:** Allow users to select hourly segments (e.g. 8–9 AM).
- **Online Payments:** Integrate Stripe, DuitNow, or Google Pay for seamless confirmation.
- **Availability Display:** Connect to a calendar grid for real-time slot visibility.
- **Reminder Emails:** Automate notifications using Apps Script.
- **Revenue Dashboards:** Add visual analytics in Google Sheets.
- **Multilingual Forms:** Offer options in Bahasa Malaysia, Tamil, and Mandarin.
- **PWA/Mobile App:** Create a mobile-friendly version as usage grows.

These enhancements are scalable and designed to grow with community demand.

## Appendix

- Google Form Link & screenshot: <https://forms.gle/KDPXWG61TVirmovr5>



- Booking tracker sample (Google Sheets) :

<https://docs.google.com/spreadsheets/d/12R7DwqSSLe17q8gzXLrr3HFsY24WKeZlGZDETwaHy6M/edit?usp=sharing>

- Google Script

```
function onFormSubmit(e) {
  if (!e || !e.values) {
    Logger.log("Error: No form submission event data.");
    return;
  }

  var sheet = SpreadsheetApp.getActiveSpreadsheet().getActiveSheet();
  var response = e.values;
  var timestamp = response[0]; // Column A
  var email = response[1]; // Column B
  var name = response[2]; // Column C
  var phone = response[3]; // Column D
  var facilities = response[4].split(', '); // Column E, split comma-separated list
  var date = response[5]; // Column F
  var time = response[6]; // Column G
  var duration = response[7]; // Column H
  var rules = response[8]; // Column I
  var row = sheet.getLastRow();

  var revenue = calculateTotalRevenue(facilities, duration);
  sheet.getRange(row, 10).setValue(revenue); // Column J: Rental Revenue (USD)

  var conflict = checkDoubleBooking(sheet, facilities, date, time, row);
  var status = conflict ? 'Pending' : 'Confirmed';
  sheet.getRange(row, 11).setValue(status); // Column K: Rental Status

  var bookingID = timestamp.replace(/^[^0-9]/g, "");
  var checkInQRCodeUrl = "https://api.qrserver.com/v1/create-qr-code/?size=150x150&data=" + encodeURIComponent(bookingID);

  // Payment QR Code (replace with your payment gateway URL)
  var paymentUrl = "https://www.paypal.com/pay?amount=" + revenue + "&email=" +
    encodeURIComponent(email) + "&item=XD_School_Booking"; // Placeholder
  var paymentQRCodeUrl = "https://api.qrserver.com/v1/create-qr-code/?size=150x150&data=" + encodeURIComponent(paymentUrl);

  var subject = "XD School Facility Booking Confirmation";
  var message = "Dear " + name + ",\n\n" +
    "Thank you for your booking!\n" +
    "Details:\n" +
    "- Facilities: " + facilities.join(', ') + "\n" +
    "- Date: " + date + "\n" +
```

```

        "- Time: " + time + "\n" +
        "- Duration: " + duration + "\n" +
        "- Rental Revenue: $" + revenue + "\n" +
        "- Status: " + status + "\n\n" +
        "Your booking supports 10 underprivileged students. Together, we're building their
        futures.\n" +
        "Scan the QR code at check-in: " + checkInQRCodeUrl + "\n" +
        "Scan the payment QR code to complete your payment: " + paymentQRCodeUrl +
        "\n\n" +
        "Best regards,\nXD School Team";

    try {
        MailApp.sendEmail({
            to: email,
            subject: subject,
            body: message
        });
    } catch (error) {
        Logger.log("Email sending failed: " + error);
    }

    if (conflict) {
        try {
            MailApp.sendEmail({
                to: email,
                subject: "XD School Booking Conflict",
                body: "Dear " + name + ",\n\nYour booking for " + facilities.join(', ') + " on " + date + " at
                " + time + " conflicts with an existing booking. We will contact you to resolve this.\n\nBest
                regards,\nXD School Team"
            });
        } catch (error) {
            Logger.log("Conflict email sending failed: " + error);
        }
    }
}

function calculateTotalRevenue(facilities, duration) {
    var rates = {
        "Swimming Pool ($23/hr)": 23,
        "Football Field A ($15/hr)": 15,
        "Football Field B ($15/hr)": 15,
        "Tennis Court A ($12/hr)": 12,
        "Tennis Court B ($12/hr)": 12,
        "Tennis Court C ($12/hr)": 12,
        "Volleyball Court A ($12/hr)": 12,
        "Volleyball Court B ($12/hr)": 12,
        "Volleyball Court C ($12/hr)": 12
    };
    var hours = parseInt(duration.split(' ')[0]) || 1;
    var totalRevenue = 0;

```

```

    facilities.forEach(function(facility) {
        totalRevenue += (rates[facility.trim()] || 12) * hours;
    });
    return totalRevenue;
}

function checkDoubleBooking(sheet, facilities, date, time, currentRow) {
    var data = sheet.getDataRange().getValues();
    for (var i = 1; i < data.length; i++) {
        var existingFacilities = data[i][4].split(', ');
        var hasConflict = facilities.some(facility => existingFacilities.includes(facility));
        if (i + 1 !== currentRow && hasConflict && data[i][5] === date && data[i][6] === time &&
data[i][10] !== 'Declined') {
            return true;
        }
    }
    return false;
}

function setupTrigger() {
    var triggers = ScriptApp.getProjectTriggers();
    for (var i = 0; i < triggers.length; i++) {
        ScriptApp.deleteTrigger(triggers[i]);
    }
    ScriptApp.newTrigger('onFormSubmit')
        .forSpreadsheet(SpreadsheetApp.getActiveSpreadsheet())
        .onFormSubmit()
        .create();
}

function testOnFormSubmit() {
    var testEvent = {
        values: ["2025/06/28 03:12:00", "test@example.com", "John Doe", "+60123456789",
"Swimming Pool ($23/hr), Tennis Court A ($12/hr)", "2025/06/28", "8:00-9:00 AM", "1
hour", "I agree to the terms and conditions"]
    };
    onFormSubmit(testEvent);
}

```

- Poster and QR code



**Rent Our Facilities to Support Students**

Help 10 underprivileged students while you play!



- Swimming Pool
- Football Fields
- Tennis Courts
- Volleyball Courts

**Weekends**  
8 AM – 12 PM

**Affordable Rates**

Swimming Pool	\$23
Football Fields	\$15
Tennis Courts	\$12
Volleyball Courts	\$12



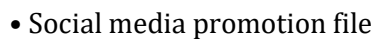
**Book Now**  
via Google Form

Your rental supports education and care!

**XD SCHOOL**



- These are screenshots from 2 responders receiving confirmation email.



The File is updated here in this drive link:

[https://drive.google.com/file/d/1GrFvG\\_v5dglQuRdGiXK3qHXoZGQqx95C/view?usp=sharing](https://drive.google.com/file/d/1GrFvG_v5dglQuRdGiXK3qHXoZGQqx95C/view?usp=sharing)

- **Drive folder link to check all the important files:**

<https://drive.google.com/drive/folders/1juqJe4DatDTh3seZawhZQanDX6i1Dy4L?usp=sharing>