

LAMPIRAN

Lampiran 1 Source Code generate_qr.php

```
<?php
require __DIR__ . '/_config.php';
require_login();

/* ===== FORCE CLEANUP QR ===== */
$deletedExpired = cleanupExpiredQr($pdo, 0);

$u = current_user();
$userId = (int)($u['id'] ?? 0);

$err = '';
$msg = '';
$created = null;

/**
 * ☒ Default durasi (jam & menit)
 */
$defaultHours = 1;
$defaultMinutes = 0;

if ($deletedExpired > 0) {
    $msg = "Auto-cleanup: {$deletedExpired} QR expired terhapus.";
}

// Logout
if (isset($_GET['logout'])) {
```

```

    if (function_exists('website_log')) {
        website_log($pdo, $userId, 'logout', 'User logged out');
    }
    $_SESSION = [];
    session_destroy();
    header('Location: login.php');
    exit;
}

/* ===== CEK ASSIGNED LOCKER USER ===== */
$currentAssignedLockerId = 0;
$assignedLocker = null;

try {
    $stmt = $pdo->prepare("SELECT NULLIF(assigned_locker_id,0) AS
assigned_locker_id FROM users WHERE id=? LIMIT 1");
    $stmt->execute([$userId]);
    $row = $stmt->fetch(PDO::FETCH_ASSOC);
    $currentAssignedLockerId = (int)($row['assigned_locker_id'] ?? 0);

    if ($currentAssignedLockerId > 0) {
        $stmt = $pdo->prepare("SELECT id, locker_number FROM lockers
WHERE id=? LIMIT 1");
        $stmt->execute([$currentAssignedLockerId]);
        $assignedLocker = $stmt->fetch(PDO::FETCH_ASSOC) ?: null;
    }
} catch (Throwable $e) {
    // tidak fatal
}

/* ===== GET LOCKER LIST ===== */

```

```

$lockers = [];

try {

    $stmt = $pdo->query("SELECT id, locker_number FROM lockers ORDER
BY id ASC");

    $lockers = $stmt->fetchAll(PDO::FETCH_ASSOC);

} catch (Throwable $e) {

    $lockers = [];

    $err = "Gagal memuat daftar loker. Cek koneksi database.";

}

/* ===== GENERATE UNIQUE QR ===== */
function generateUniqueDynamicQr(PDO $pdo): string {
    for ($i = 0; $i < 20; $i++) {
        $qr = 'DYN_' . strtoupper(bin2hex(random_bytes(8)));

        $stmt = $pdo->prepare("SELECT id FROM dynamic_qr_codes WHERE
qr_code = ? LIMIT 1");

        $stmt->execute([$qr]);

        if (!$stmt->fetch()) return $qr;
    }
    return 'DYN_' . strtoupper(bin2hex(random_bytes(16)));
}

/* ===== HANDLE POST ===== */
if ($_SERVER['REQUEST_METHOD'] === 'POST') {

    $notes = trim($_POST['notes'] ?? '');

    // ☒ kalau user masih memakai locker, paksa locker_id = assigned
locker

    $requestedLockerId = (int)($_POST['locker_id'] ?? 0);

    if ($currentAssignedLockerId > 0) {

        $requestedLockerId = $currentAssignedLockerId;

    }
}

```

```

// ✅ input ketik durasi
$hours    = (int)($_POST['expire_hours'] ?? $defaultHours);
$minutes  = (int)($_POST['expire_minutes'] ?? $defaultMinutes);

// validasi range
if ($hours < 0)    $hours = 0;
if ($hours > 12)  $hours = 12;

if ($minutes < 0)    $minutes = 0;
if ($minutes > 59)  $minutes = 59;

$expireMinutes = ($hours * 60) + $minutes;

// minimal 1 menit, maksimal 12 jam
if ($expireMinutes < 1)    $expireMinutes = 1;
if ($expireMinutes > 12*60) $expireMinutes = 12*60;

if ($requestedLockerId <= 0) {
    $err = "Silakan pilih loker terlebih dahulu.";
} else {
    try {
        // Pastikan locker_id valid
        $stmt = $pdo->prepare("SELECT id, locker_number FROM lockers
WHERE id = ? LIMIT 1");
        $stmt->execute([$requestedLockerId]);
        $locker = $stmt->fetch(PDO::FETCH_ASSOC);

        if (!$locker) {
            $err = "Loker yang dipilih tidak ditemukan.";
        } else {

```

```

$qrCode      = generateUniqueDynamicQr($pdo);
$accessCode = 'AC_' . strtoupper(bin2hex(random_bytes(8)));

$pdo->beginTransaction();

// ☒ INSERT dynamic qr (multi-use, tetap 'active' sampai
expires_at)
$stmt = $pdo->prepare("
    INSERT INTO dynamic_qr_codes
        (user_id, requested_locker_id, qr_code, access_code,
status, created_at, expires_at, notes)
    VALUES
        (:user_id, :locker_id, :qr_code, :access_code, 'active',
NOW(), DATE_ADD(NOW(), INTERVAL :exp MINUTE), :notes)
");
$stmt->execute([
    ':user_id'      => $userId,
    ':locker_id'    => (int)$locker['id'],
    ':qr_code'      => $qrCode,
    ':access_code' => $accessCode,
    ':exp'          => (int)$expireMinutes,
    ':notes'        => ($notes !== '') ? $notes : null,
]);

// simpan qr aktif terakhir ke users.qr_code (buat preview
di dashboard)
$stmt = $pdo->prepare("UPDATE users SET qr_code = ? WHERE id
= ?");
$stmt->execute([$qrCode, $userId]);

$pdo->commit();

if (function_exists('website_log')) {

```

```

        website_log(
            $pdo,
            $userId,
            'generate_qr',
            "Generated QR={\$qrCode} locker_id={\$locker['id']}
locker_number={\$locker['locker_number']} exp={\$expireMinutes}m"
        );
    }

    $created = [
        'qr_code' => $qrCode,
        'access_code' => $accessCode,
        'locker_id' => (int)$locker['id'],
        'locker_number' => (string)$locker['locker_number'],
        'expires_minutes' => (int)$expireMinutes,
        'expires_h' => (int)floor($expireMinutes / 60),
        'expires_m' => (int)($expireMinutes % 60),
    ];

    $durText = ($created['expires_h'] > 0 ?
($created['expires_h']." jam ") : "") . ($created['expires_m']."
menit");

    $msg2 = "QR berhasil dibuat untuk {$locker['locker_number']}
(berlaku {$durText}).";

    $msg = $msg ? ($msg . " " . $msg2) : $msg2;
}

} catch (Throwable $e) {
    if ($pdo->inTransaction()) $pdo->rollBack();

    if (function_exists('website_log')) {
        website_log($pdo, $userId, 'generate_qr_error', $e-
>getMessage());
    }
}

```

```

        $err = "Gagal membuat QR. Cek struktur tabel (kolom
requested_locker_id) atau constraint database.";

    }

}

?>

<!doctype html>

<html lang="id">

<head>

    <meta charset="utf-8">

    <meta name="viewport" content="width=device-width, initial-
scale=1">

    <title>Generate QR - Smart Locker</title>

    <link rel="stylesheet" href="css/generate_qr.css">

<style>

    .row-inline{display:grid;grid-template-columns:1fr 1fr;gap:10px}

    @media (max-width:700px){.row-inline{grid-template-columns:1fr}}

    .muted.small{font-size:12px;opacity:.75}

    /* ✅ label Jam/Menit dibuat gede + bold */

    .expire-label{

        font-size: 15px;

        font-weight: 800;

        opacity: 1;

        margin-bottom: 6px;

        color: #0f172a;

    }

    .msg.warn{

```

```

        background:#fff7e6;
        border:1px solid rgba(255,193,7,.35);
        color:#7a4c00;
        padding:10px 12px;
        border-radius:12px;
        margin:10px 0;
        font-weight:700;
    }
</style>
</head>
<body>

<header class="topbar">
    <div class="container topbar-inner">
        <div class="brand">
            <div class="brand-title">Smart Locker</div>★
            <div class="brand-sub">Generate QR Code</div>
        </div>
        <div class="topbar-actions">
            <span class="pill">Hi, <?= htmlspecialchars($u['full_name'] ??
$u['username'] ?? '-') ?></span>
            <a class="btn" href="dashboard.php">Dashboard</a>
            <a class="btn danger" href="?logout=1">Logout</a>
        </div>
    </div>
</header>

<main class="container">
    <div class="grid">

        <section class="card span-6">

```

```

<h2>Generate QR Code</h2>

<p class="muted">QR akan expired sesuai durasi yang kamu
ketik.</p>

<?php if ($err): ?><div class="msg bad"><?=
htmlspecialchars($err) ?></div><?php endif; ?>

<?php if ($msg): ?><div class="msg ok"><?=
htmlspecialchars($msg) ?></div><?php endif; ?>

<?php if ($currentAssignedLockerId > 0): ?>
    <div class="msg warn">
        Kamu masih menggunakan loker
        <b><?= htmlspecialchars($assignedLocker['locker_number']
?? ('ID-'. $currentAssignedLockerId)) ?></b>.
        QR baru akan dibuat untuk loker tersebut (untuk buka lagi
walaupun QR sebelumnya expired).
    </div>
<?php endif; ?>

<form method="post">
    <label>Pilih Loker</label>

    <?php if ($currentAssignedLockerId > 0): ?>
        <select name="locker_id" required disabled>
            <option value="<?= (int)$currentAssignedLockerId ?>"
selected>
                <?= htmlspecialchars($assignedLocker['locker_number']
?? ('ID-'. $currentAssignedLockerId)) ?>
            </option>
        </select>
        <input type="hidden" name="locker_id" value="<?=
(int)$currentAssignedLockerId ?>">
    <?php else: ?>
        <select name="locker_id" required>

```

```

<option value="">-- Pilih Loker --</option>
<?php foreach ($lockers as $l): ?>
    <option value="<?= (int)$l['id'] ?>"
        <?= ((int)($_POST['locker_id'] ?? 0) ===
(int)$l['id']) ? 'selected' : '' ?>>
        <?= htmlspecialchars($l['locker_number']) ?>
    </option>
<?php endforeach; ?>
</select>
<?php endif; ?>

<!-- ☒ INPUT KETIK DURASI -->
<label>Durasi QR</label>
<?php
    $valH = (int)($_POST['expire_hours'] ?? $defaultHours);
    $valM = (int)($_POST['expire_minutes'] ??
$defaultMinutes);
    if ($valH < 0) $valH = 0; if ($valH > 12) $valH = 12;
    if ($valM < 0) $valM = 0; if ($valM > 59) $valM = 59;
?>
<div class="row-inline">
    <div>
        <div class="expire-label">Jam (0-12)</div>
        <input type="number" name="expire_hours" min="0"
max="12" value="<?= (int)$valH ?>" required>
    </div>
    <div>
        <div class="expire-label">Menit (0-59)</div>
        <input type="number" name="expire_minutes" min="0"
max="59" value="<?= (int)$valM ?>" required>
    </div>
</div>

```

```

<div class="muted small" style="margin-top:8px;">
    Minimal 1 menit, maksimal 12 jam.
</div>

<label>Catatan (opsional)</label>

<textarea name="notes" rows="3" placeholder="misal: pinjam
loker untuk 3 jam"><?= htmlspecialchars($_POST['notes'] ?? '')
?></textarea>

<div class="actions">
    <button class="btn primary" type="submit">Generate
QR</button>
    <a class="btn" href="dashboard.php">Kembali</a>
</div>
</form>
</section>

<section class="card span-6">
    <h2>QR Preview</h2>

    <?php if (!$created): ?>
        <div class="muted">QR akan muncul setelah generate.</div>
    <?php else: ?>
        <div class="msg ok">
            <div><b>QR Code:</b> <?=
htmlspecialchars($created['qr_code']) ?></div>
            <div><b>Access Code:</b> <?=
htmlspecialchars($created['access_code']) ?></div>
            <div><b>Loker:</b> <?=
htmlspecialchars($created['locker_number']) ?></div>
            <div><b>Berlaku:</b>
                <?= (int)$created['expires_h'] ?> jam <?=
(int)$created['expires_m'] ?> menit

```

```

        (<?= (int)$created['expires_minutes'] ?> menit)
    </div>
</div>

<div class="qr-wrap">
    <div id="qrcode" class="qr-box"></div>
</div>

<script
src="https://cdnjs.cloudflare.com/ajax/libs/qrcodejs/1.0.0/qrcode.mi
n.js"></script>
<script>
    const el = document.getElementById("qrcode");
    el.innerHTML = "";
    new QRCode(el, {
        text: <?= json_encode($created['qr_code']) ?>,
        width: 220,
        height: 220
    });
</script>
<?php endif; ?>
</section>

</div>
</main>
</body>
</html>

```

Lampiran 2 Source Code assign_locker.php

```
<?php
require __DIR__ . '/db.php';

header('Content-Type: application/json; charset=utf-8');

function respond(array $arr, int $code = 200): void {
    http_response_code($code);
    echo json_encode($arr);
    exit;
}

/**
 * Cek sesi aktif locker_usage_history untuk sebuah locker.
 * return: ['id'=>..., 'user_id'=>..., 'started_at'=>...,
 * 'method'=>...]
 */
function getActiveUsage(PDO $pdo, int $lockerId): ?array {
    $stmt = $pdo->prepare("
        SELECT id, user_id, started_at, method
        FROM locker_usage_history
        WHERE locker_id = ?
        AND ended_at IS NULL
        ORDER BY started_at DESC
        LIMIT 1
    ");
    $stmt->execute([$lockerId]);
    $row = $stmt->fetch(PDO::FETCH_ASSOC);
    return $row ?: null;
}
```

```

/**
 * Start usage ke locker_usage_history:
 * - kalau ada sesi aktif dan user sama => tidak insert lagi
  (opsional)
 * - kalau ada sesi aktif dan user beda => JANGAN tutup otomatis
  (tolak di level atas)
 * - kalau tidak ada sesi aktif => insert
 *
 * qr_expires_at disimpan hanya untuk QR (snapshot dari
  dynamic_qr_codes.expires_at)
 */
function startLockerUsage(PDO $pdo, int $userId, int $lockerId,
string $method, string $note = '', ?string $qrExpiresAt = null):
void {
    if ($userId <= 0 || $lockerId <= 0) return;

    $active = getActiveUsage($pdo, $lockerId);
    if ($active) {
        $activeUserId = (int)($active['user_id'] ?? 0);
        // user sama masih aktif => tidak perlu insert baru
        if ($activeUserId === $userId) return;

        // user beda => jangan diapa-apain (harusnya sudah ditolak
        sebelum sini)
        return;
    }

    $stmt = $pdo->prepare("
        INSERT INTO locker_usage_history
            (user_id, locker_id, method, started_at, qr_expires_at, note)
        VALUES
            (?, ?, ?, NOW(), ?, ?)
    ");

```

```

    ");
    $stmt->execute([
        $userId,
        $lockerId,
        strtoupper($method),
        $qrExpiresAt,
        $note
    ]);
}

/* ===== AUTH API KEY ===== */
$API_KEY = 'SMART_LOCKER_123';
$headers = $_SERVER['HTTP_X_API_KEY'] ?? '';
if ($headers !== $API_KEY) {
    respond(['ok' => false, 'error' => 'unauthorized'], 401);
}

/* ===== READ JSON ===== */
$raw = file_get_contents('php://input');
$data = json_decode($raw, true);
if (!is_array($data)) {
    respond(['ok' => false, 'error' => 'invalid json'], 400);
}

$code      = trim((string)($data['qr_code'] ?? ''));
$locker_id = (int)($data['locker_id'] ?? 0);

if ($code === '') {
    respond(['ok' => false, 'error' => 'qr_code required'], 400);
}

```

```

try {
    /* =====
    RFID MODE
    ===== */

    if (strpos($code, 'RFID_') === 0) {
        if ($locker_id <= 0) {
            respond(['ok' => false, 'error' => 'locker_id required for
rfid'], 400);
        }

        $uid = strtoupper(trim(substr($code, 5)));
        if ($uid === '') {
            respond(['ok' => false, 'error' => 'uid empty'], 400);
        }

        // user by UID
        $stmt = $pdo->prepare("SELECT id FROM users WHERE uid = ? LIMIT
1");
        $stmt->execute([$uid]);
        $user = $stmt->fetch(PDO::FETCH_ASSOC);
        if (!$user) {
            respond(['ok' => false, 'error' => 'user not found by uid',
'uid' => $uid], 404);
        }
        $userId = (int)$user['id'];

        // locker by ID
        $stmt = $pdo->prepare("SELECT id, locker_number, relay_pin FROM
lockers WHERE id = ? LIMIT 1");
        $stmt->execute([$locker_id]);
        $locker = $stmt->fetch(PDO::FETCH_ASSOC);
        if (!$locker) {

```

```

        respond(['ok' => false, 'error' => 'locker not found'], 404);
    }

    // ✅ CEK LOCKER SEDANG DIPAKAI USER LAIN?
    $active = getActiveUsage($pdo, (int)$locker_id);
    if ($active && (int)$active['user_id'] !== $userId) {
        respond([
            'ok' => false,
            'error' => 'locker_in_use_by_other',
            'message' => 'Loker sedang dipakai user lain.',
            'locker_id' => (int)$locker_id,
            'active_user_id' => (int)$active['user_id'],
        ], 403);
    }

    // assign locker ke user (boleh, tapi tetap terikat oleh history
    // di atas)
    $pdo->prepare("UPDATE users SET assigned_locker_id = ? WHERE id
    = ?")
        ->execute([(int)$locker_id, $userId]);

    // log akses
    $pdo->prepare("
        INSERT INTO access_logs (user_id, qr_code, scanner_id,
        access_result, relay_pin, access_time)
        VALUES (?, ?, 'ESP32-RFID', 'GRANTED', ?, NOW())
    ")>execute([$userId, $code, (int)$locker['relay_pin']);

    // history (RFID)
    startLockerUsage($pdo, $userId, (int)$locker_id, 'RFID', 'Scan
    RFID', null);

```

```

respond([
    'ok' => true,
    'mode' => 'rfid',
    'user_id' => $userId,
    'locker_id' => (int)$locker_id,
    'locker_number' => (string)$locker['locker_number'],
    'relay_pin' => (int)$locker['relay_pin'],
    'uid' => $uid
]);
}

/* =====
QR MODE
===== */

// cari QR
$stmt = $pdo->prepare("
    SELECT id, user_id, status, expires_at, requested_locker_id
    FROM dynamic_qr_codes
    WHERE qr_code = ?
    LIMIT 1
");
$stmt->execute([$code]);
$qqr = $stmt->fetch(PDO::FETCH_ASSOC);

if (!$qqr) {
    respond(['ok' => false, 'error' => 'qr not found'], 404);
}

$status = (string)($qqr['status'] ?? '');
if ($status !== 'active') {

```

```

        respond(['ok' => false, 'error' => 'qr invalid status', 'status'
=> $status], 400);
    }

    // expired => DENY + arahan generate lagi
    if (!empty($qr['expires_at'])) {
        $expTs = strtotime((string)$qr['expires_at']);
        if ($expTs !== false && $expTs <= time()) {
            respond([
                'ok' => false,
                'error' => 'qr expired',
                'message' => 'QR kamu sudah expired. Silakan generate QR
baru untuk membuka loker lagi.',
                'expires_at' => (string)$qr['expires_at'],
                'requested_locker_id' => (int)($qr['requested_locker_id'] ??
0),
                'user_id' => (int)($qr['user_id'] ?? 0),
            ], 400);
        }
    }

    $userId = (int)$qr['user_id'];
    $qrExpiresAt = !empty($qr['expires_at']) ?
(string)$qr['expires_at'] : null;

    // ✅ FIX: locker tujuan QR HARUS dari requested_locker_id (anti
spoof)
    $locker_id_final = (int)($qr['requested_locker_id'] ?? 0);
    if ($locker_id_final <= 0) {
        respond(['ok' => false, 'error' => 'QR has no
requested_locker_id'], 400);
    }

```

```

// locker by ID

$stmt = $pdo->prepare("SELECT id, locker_number, relay_pin FROM
lockers WHERE id = ? LIMIT 1");

$stmt->execute([$locker_id_final]);

$locker = $stmt->fetch(PDO::FETCH_ASSOC);

if (!$locker) {
    respond(['ok' => false, 'error' => 'locker not found'], 404);
}

// ☒ CEK LOCKER SEDANG DIPAKAI USER LAIN?
$active = getActiveUsage($pdo, (int)$locker_id_final);
if ($active && (int)$active['user_id'] !== $userId) {
    respond([
        'ok' => false,
        'error' => 'locker_in_use_by_other',
        'message' => 'Loker sedang dipakai user lain.',
        'locker_id' => (int)$locker_id_final,
        'active_user_id' => (int)$active['user_id'],
    ], 403);
}

// assign locker ke user (user sendiri)
$pdo->prepare("UPDATE users SET assigned_locker_id = ? WHERE id =
?")
    ->execute([(int)$locker_id_final, $userId]);

// update last used time (optional)
$pdo->prepare("UPDATE dynamic_qr_codes SET actual_checkout = NOW()
WHERE id = ?")
    ->execute([(int)$qr['id']]);

// log akses

```

```

        $pdo->prepare("
            INSERT INTO access_logs (user_id, qr_code, scanner_id,
            access_result, relay_pin, access_time)

            VALUES (?, ?, 'ESP32-QR', 'GRANTED', ?, NOW())

        ")->execute([$userId, $code, (int)$locker['relay_pin']]);

        // history + snapshot expires_at
        startLockerUsage($pdo, $userId, (int)$locker_id_final, 'QR', 'Scan
        QR', $qrExpiresAt);

        respond([
            'ok' => true,
            'mode' => 'qr',
            'user_id' => $userId,
            'locker_id' => (int)$locker['id'],
            'locker_number' => (string)$locker['locker_number'],
            'relay_pin' => (int)$locker['relay_pin'],
            'qr_status' => $status,
            'qr_expires_at' => $qrExpiresAt
        ]);

    } catch (Throwable $e) {
        // kalau mau debug cepat, sementara bisa kirim $e->getMessage() ke
        log file

        respond(['ok' => false, 'error' => 'server error'], 500);
    }
}

```

Lampiran 3 Surat Keterangan Hasil Pengecekan Hasil Turnitin



UNIVERSITAS DARMA PERSADA
UPT PERPUSTAKAAN
Gedung Rektorat Lantai 3,
Jl. Taman Malaka Selatan, Pondok Kelapa – Jakarta Timur 13450

SURAT KETERANGAN HASIL PENGECEKAN TURNITIN

UPT Perpustakaan Universitas Darma Persada menerangkan telah selesai melakukan pemeriksaan duplikasi/*similarity* menggunakan perangkat lunak Turnitin terhadap hasil karya sebagai berikut:

Judul : RANCANG BANGUN SISTEM SMARTLOCKER
MENGUNAKAN AUTENTIKASI QR & RFID DENGAN
TERINTEGRASI INTERNET OF THINGS (IOT)

Penulis : Alvin Adam Anton Suryadarma

NIM : 2022230008

Tgl pemeriksaan : 6 Februari 2026

Dengan hasil Tingkat Kesamaan (*similarity index*) **18%**

Demikian Surat Keterangan kami buat, untuk dipergunakan sebagaimana mestinya.

Jakarta, 6 Februari 2026

Ka.UPT Perpustakaan Unsada

Yus Rusmiyati, SS., MM

Batas maksimal similarity 30% untuk Fakultas Sastra dan Ekonomi

Batas maksimal similarity 25% untuk Fakultas Teknik, Kelautan
dan Pasca Sarjana

Lampiran 4 Hasil Pengecekan Hasil Turnitin

2022230008_Alvin Adam Anton Suryadarma			
ORIGINALITY REPORT			
18%	16%	13%	%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS
PRIMARY SOURCES			
1	repository.widyatama.ac.id Internet Source	1%	
2	repository.umsu.ac.id Internet Source	1%	
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