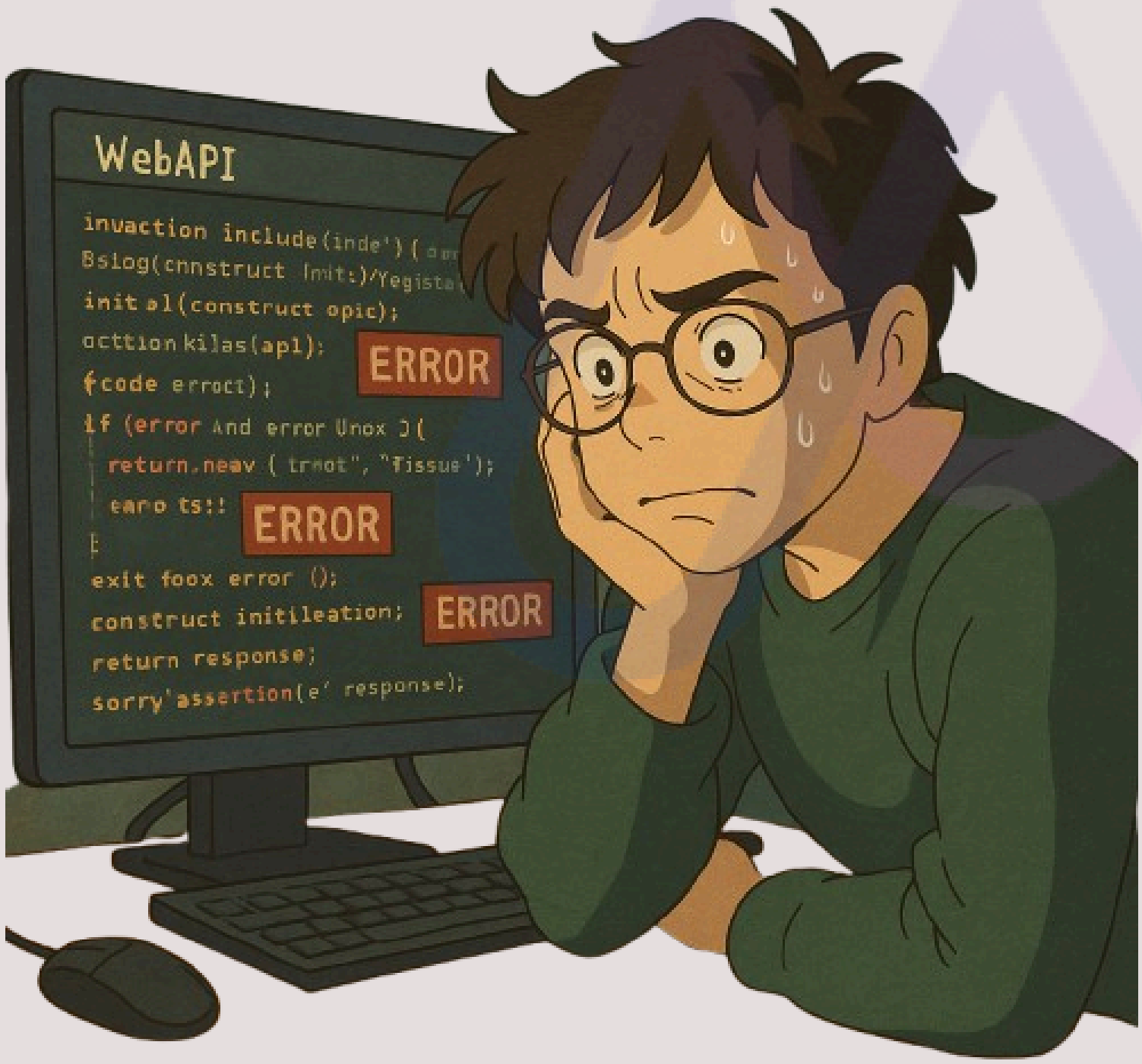
Ajay Patel

.NET

20 Mistakes You Makes When Creating Web APIs



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1. Not Using HttpClientFactory

Creating HttpClient manually can lead to socket exhaustion, which causes APIs to become unresponsive under load.

❌ Bad Practice

```
using (HttpClient client = new HttpClient())
{
}

//Or
private static readonly HttpClient client = new HttpClient();
```

✅ Good Practice

```
//Register service
builder.Services.AddHttpClient();

// Use construction injection
public HttpClientFactoryService(IHttpClientFactory httpClientFactory)
{
    _httpClientFactory = httpClientFactory;
}

//Use and create new HttpClient
var httpClient = _httpClientFactory.CreateClient();
```

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2. Not Using OpenTelemetry for Observability

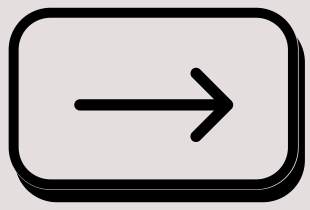
Monitoring only exceptions or logs isn't enough. Without proper observability, debugging production issues is like chasing ghosts.

❌ Bad Practice

```
//No trace context or metrics across services
_logger.LogInformation("Order created");
```

✅ Good Practice

```
builder.Services.AddOpenTelemetry()
    .WithTracing(builder ⇒
    {
        builder
            .AddAspNetCoreInstrumentation()
            .AddHttpClientInstrumentation()
            .AddConsoleExporter();
    });
```



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3. Not Implementing Rate Limiting

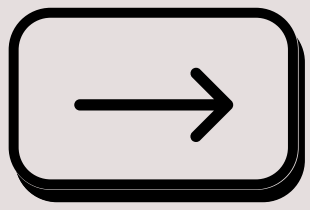
Without rate limiting, your API is exposed to abuse—malicious users or faulty clients can overwhelm it.

❌ Bad Practice

```
// No restriction on API usage per user
[HttpGet("resource")]
public IActionResult GetResource() { ... }
```

✅ Good Practice

```
builder.Services.AddRateLimiter(options => options
    .AddFixedWindowLimiter("fixed", config =>
    {
        config.PermitLimit = 100;
        config.Window = TimeSpan.FromMinutes(1);
    }));
```



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4. Ignoring CORS (Cross-Origin Resource Sharing)

Blocking API requests across different origins? CORS configuration matters

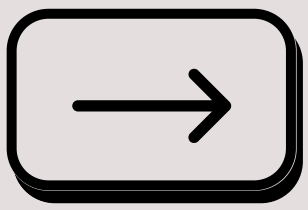
❌ Bad Practice

```
builder.Services.AddCors();
```

✅ Good Practice

```
services.AddCors(options ⇒
{
    options.AddPolicy("AllowSpecificOrigin",
        builder ⇒ builder.WithOrigins("https://myclient.com")
        .AllowAnyMethod()
        .AllowAnyHeader());
});
```

Restrict origins smartly—don’t just allow everything.



5. Not Enabling Response Compression

Sending large JSON payloads without compression leads to high bandwidth usage and slower responses.

✅ Good Practice

```
builder.Services.AddResponseCompression(options ⇒
{
    options.EnableForHttps = true;
    options.Providers.Add<GzipCompressionProvider>();
});
```

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6. Ignoring API Versioning

APIs evolve—version them properly to avoid breaking changes

❌ Bad Practice

```
[Route("api/users")]
public class UsersController : ControllerBase
{

}
```

✅ Good Practice

```
[ApiVersion("1.0")]
[Route("api/v{version:apiVersion}/users")]
public class UsersController : ControllerBase {}
```

Use URL-based or header-based versioning.

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7. Not Using Global Exception Handler

Uncaught exceptions can lead to crashes, security vulnerabilities, and difficult debugging. APIs should always handle exceptions gracefully and provide meaningful responses.

❌ Bad Practice

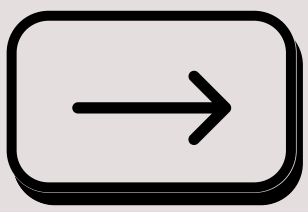
```
// No Global Exception Handler to handle it.
throw new Exception("Exception while fetching all the users.");
```

✅ Good Practice

```
builder.Services.AddExceptionHandler<GlobalExceptionHandler>();
builder.Services.AddProblemDetails();

app.UseExceptionHandler();
```

Implement centralized exception handling to keep APIs robust and maintainable.



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8. Forgetting to Cache Responses

Every request shouldn't hit the database—use caching.

❌ Bad Practice

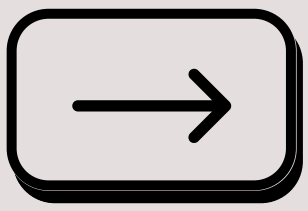
```
//No caching used. So, fetched from database.

return await _dbContext.Users.
    SingleOrDefaultAsync((user) ⇒ user.ProductId == id, token);
```

✅ Good Practice

```
builder.Services.AddHybridCache();

//apply Hybrid Cache
var user = await _cache.GetOrCreateAsync(
$"user-{id}",
async token ⇒
{
    return await _dbContext.Users
        .SingleOrDefaultAsync(user ⇒ user.ProductId == id, token);
}
```



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9. Not Using Asynchronous Calls

Blocking operations can degrade API performance, causing slow responses and thread starvation. When handling I/O-bound operations, always prefer async/await.

❌ Bad Practice

```
public IActionResult GetUser(int id)
{
    var user = _dbContext.Users.Find(id);
    return Ok(user);
}
```

✅ Good Practice

```
public async Task<IActionResult> GetUser(int id)
{
    var user = await _dbContext.Users.FindAsync(id);
    return Ok(user);
}
```

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10. Not Supporting Pagination in Large Responses

A massive dataset shouldn’t be dumped all at once—always paginate.

❌ Bad Practice

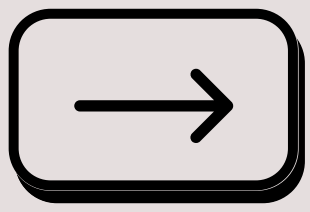
```
return Ok(await _dbContext.Users.ToListAsync());
```

✅ Good Practice

```
var result = await _dbContext.Users
                .Skip(page * size)
                .Take(size)
                .ToListAsync();

return Ok(result);
```

Improve performance with paging, filtering, and sorting



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11. Exposing Sensitive Data in DTOs

Exposing sensitive fields like passwords, API keys, or payment details in DTOs can lead to serious security risks.

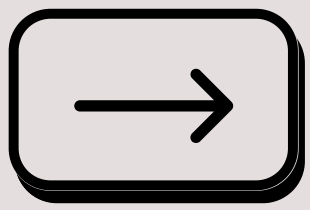
❌ Bad Practice

```
public class UserDto
{
    public string Username { get; set; }
    public string Email { get; set; }
    public string Password { get; set; } // 🚨
}
```

✅ Good Practice

```
public class UserDto
{
    public string Username { get; set; }
    public string Email { get; set; }
}
```

Apply DTOs properly by keeping them lean and secure.



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12. Not Using Dependency Injection

Tightly coupled database calls in controllers, making testing impossible.

❌ Bad Practice

```
public class OrderService
{
    private PaymentService _paymentService = new PaymentService();

    public void ProcessOrder(Order order)
    {
        _paymentService.ProcessPayment(order);
    }
}
```

✅ Good Practice

```
public class OrderService
{
    private readonly IPaymentService _paymentService;

    public OrderService(IPaymentService paymentService)
    {
        _paymentService = paymentService;
    }

    public void ProcessOrder(Order order)
    {
        _paymentService.ProcessPayment(order);
    }
}
```

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13. Not Documenting the API

A well-designed API is useless if developers can’t understand how to use it. Lack of documentation leads to confusion, wasted time, and frustration.

✅ Good Practice

```
builder.Services.AddSwaggerGen(c ⇒
{
    c.SwaggerDoc("v1", new OpenApiInfo { Title = "Users API", Version = "v1" });
});
```

Always document APIs using OpenAPI (Swagger), Postman, etc.

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14. Ignoring Proper HTTP Status Codes

Returning incorrect HTTP status codes leads to confusing client behavior and makes debugging harder. APIs should follow standard conventions for better clarity.

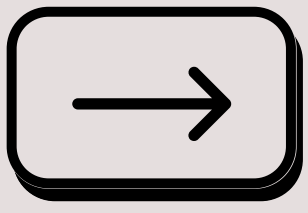
❌ Bad Practice

```
return Ok(new { error = "Invalid parameters." });
```

✅ Good Practice

```
return BadRequest(new { error = "Invalid parameters." });
```

Use 200 OK, 201 Created, 204 No Content, 400 Bad Requests, 401 Unauthorized, 403 Forbidden, 404 Not Found, 409 Conflict, and 500 for Internal Server Errors.



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15. Using GET for Actions That Modify Data

GET is safe and idempotent—it shouldn't change state.

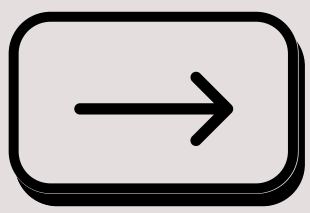
❌ Bad Practice

```
[HttpGet("api/users/{id}")]
public IActionResult DeleteUser(int id)
{
    /* Delete logic */
}
```

✅ Good Practice

```
[HttpDelete("api/users/{id}")]
public IActionResult DeleteUser(int id)
{
    /* Delete logic */
}
```

Use POST, PUT, or DELETE for modifications



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16. Forgetting to Log API Calls

No logs = no way to debug issues.

❌ Bad Practice

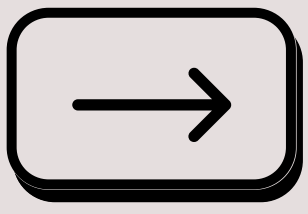
```
return BadRequest("Error Message");
```

✅ Good Practice

```
_logger.LogError("Error Message");

return BadRequest("Error Message");
```

Use structured logging with Serilog or Application Insights.



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17. Overcomplicating Authentication & Authorization

API security should be simple yet robust. Don’t reinvent the wheel—use JWT, OAuth, or API Keys.

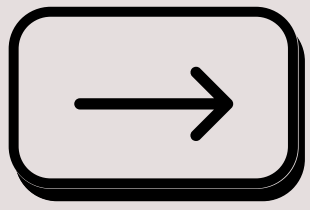
❌ Bad Practice

```
public bool IsAuthenticated(string username, string password)
{
   /* Custom auth logic */
}
```

✅ Good Practice

```
services.AddAuthentication(JwtBearerDefaults.AuthenticationScheme)
        .AddJwtBearer(options ⇒ { /* Configure JWT */ });
```

Leverage frameworks for security, not custom hacks.



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18. Not Validating Input Data

Skipping validation leads to broken requests and potential security risks. Always validate incoming data.

❌ Bad Practice

```
public IActionResult CreateUser(UserDto user)
{
    await _userService.SaveAsync(user);
    return CreatedAtRoute(...);
}
```

✅ Good Practice

Use FluentValidation, DataAnnotation to ensure correctness.

```
public IActionResult CreateUser(UserDto user)
{
    var result = await _validator.ValidateAsync(user);

    if (!result.IsValid)
    {
        return BadRequest(result);
    }

    await _userService.SaveAsync(user);
    return CreatedAtRoute(...);
}
```

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19. Poorly Designed Endpoint Naming

APIs should be predictable and logical.

❌ Bad Practice

```
GET /getUserDetails
POST /createNewUserEntry
DELETE /removeAccount
```

✅ Good Practice

```
GET /users/{id}
POST /users
DELETE /users/{id}
```

Follow RESTful conventions for clarity.

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20. Hardcoding Configuration Value

Never embed secrets or configuration in code.

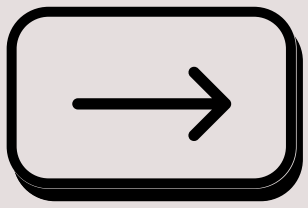
❌ Bad Practice

```
string connectionString = "Server=localhost;Database=mydb;User=myuser;Password=mypassword;";
```

✅ Good Practice

```
"ConnectionStrings": {
    "DefaultConnection": "Server=localhost;Database=mydb;User=myuser;Password=mypassword;"
}
```

Use IConfiguration or Options pattern for flexible setups



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