Day-2: Building News Platform with Laravel API - CRUD for News and Images

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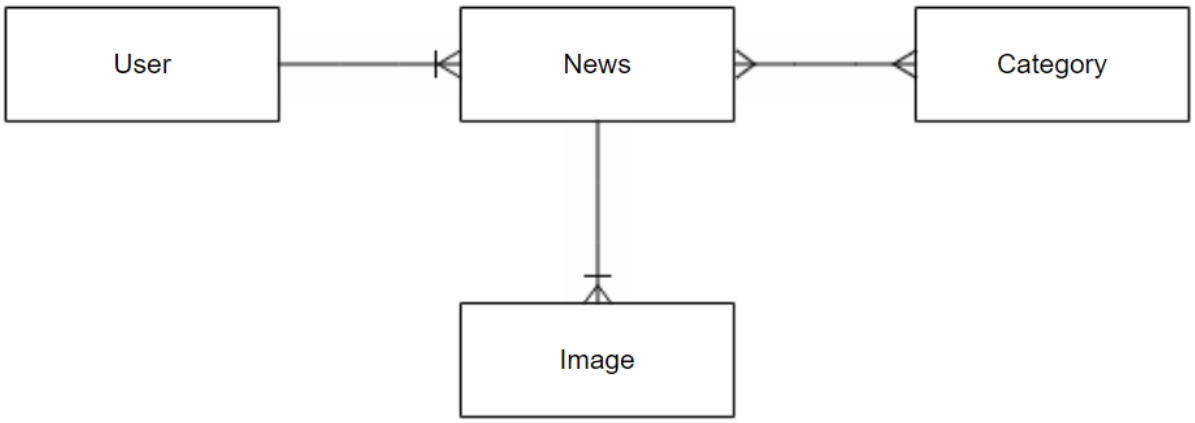
Application overview:

Our goal is to create a News Platform's CRUD APIs with the following entities:

- ***Category***: To categorize news articles.
- ***News***: To store news articles.
- ***Image***: To associate image album with news articles.
- ***User***: To manage user accounts.



Training program:

Day-1	Setup. CRUD for Category entity.
Day-2	CRUD for News, Image entities. Upload image files to server. One-to-Many and Many-to-Many associations.
Day-3	Recap. Filtering, Sorting, and Pagination of list results.
Day-4	Laravel Passport authentication (OAuth2 token-based) Register, Login, Logout, and Profile APIs for User entity. Public vs. Protected endpoints.
Day-5	Localization. Deployment (Docker).

Learning objectives:

- Create News and Image tables.
- Create RESTful API for CRUD operations.
- Handle one-to-many and many-to-many associations.
- Upload image files to server.
- Hands-on.

Steps:

1- **Environment**
   - Run XAMP control panel.
   - Start Apache server
   - Start MySQL server
   - Open VS Code on previous project.

2- **News Module (Migration -> Model -> Factory -> Seeder -> Resource)**
   - Create News model, migration, and factory.
   - php artisan make:model News -mf
   - The flag -mf creates factory, and migrations files in addition to model file.
   - ***Migration***
   - Open ***database/migrations/timestamp_create_news_table.php*** file.
   - Add fields ***title***, ***description***, ***thumbnail***, ***completed***, and ***visible***.
   - $table->string('title');
   - $table->text('body')->nullable();
   - $table->string('thumbnail')->nullable();
   - $table->boolean('completed')->default(false);
   - $table->boolean('visible')->default(false);
   - ***Model***
   - Open ***app/Models/News.php*** file.
   - Add fields ***title***, ***description***, ***thumbnail***, ***completed***, and ***visible***.
   - protected $fillable = [
   - 'title',
   - 'body',
   - 'thumbnail',
   - 'completed',
   - 'visible'
   -];
   - ***Factory***
   - Open ***database/factories/NewsFactory.php*** file.
   - Create fake values for fields ***title***, ***description***, ***thumbnail***, ***completed***, and ***visible***.
   - 'title' => ucwords(fake()->words(rand(3, 6), true)),
   - 'body' => fake()->text(),
   - 'thumbnail' => fake()->imageUrl(),
   - 'completed' => fake()->randomElement([true, false]),
   - 'visible' => fake()->randomElement([true, false])
   - ***Seeder***
   - Open ***database/seeders/DatabaseSeeder.php*** file.
   - Populate database with 20 dummy news.
   - News::factory(20)->create();
   - Migrate changes to database schema.
   - php artisan migrate
   - [if migration failed due to an existing table, drop it from the database then re-migrate].
   - Run seeding

- `php artisan db:seed`
- Check database changes in MySQL (phpMyAdmin)
- ***Resource***
- Create News resource.
- `php artisan make:resource NewsResource`
- Open ***app/Http/Resources/NewsResource.php*** file.
- Return only the article's ***id***, ***title,*** and ***thumbnail*** (e.g. for the slider on the home page).

```
[
    'id' => $this->resource->id,
    'title' => $this->resource->title,
    'thumbnail' => $this->resource->thumbnail
];
```

- Create News collection.
- `php artisan make:resource NewsCollection --collection`
- Open ***app/Http/Resources/NewsCollection.php*** file.
- Return the objects as defined in the resource.

```
[
    'count' => $this->collection->count(),
    'news_articles' => $this->collection,
];
```

3- Image Module (Migration -> Model -> Factory -> Seeder -> Resource)

- Create Image model, migration, and factory.
- `php artisan make:model Image -mf`
- The flag -mf creates factory, and migrations files in addition to model file.
- ***Migration***
- Open ***database/migrations/timestamp_create_images_table.php*** file.
- Add field ***url***.
- `$table->string('url');`
- ***Model***
- Open ***app/Models/Image.php*** file.
- Add field ***url***.

```
protected $fillable = [
    'url'
];
```

- ***Factory***
- Open ***database/factories/ImageFactory.php*** file.
- Create fake values for field ***url***.
- `'url'  => fake()->imageUrl()`
- ***Seeder***
- Open ***database/seeders/DatabaseSeeder.php*** file.
- Populate database with 20 dummy images
- `Image::factory(20)->create();`
- Migrate changes to database schema.
- `php artisan migrate`

- [if migration failed due to an existing table, drop it from the database then re-migrate].
- Refresh migrations to empty the tables and reseed.

```
- php artisan migrate:refresh
```

- Run seeding

```
- php artisan db:seed
```

- Check database changes in MySQL (phpMyAdmin)
- ***Resource***
- Create Image resource.

```
- php artisan make:resource ImageResource
```

- Open ***app/Http/Resources/ImageResource.php*** file.
- Return only the image's ***id***, and ***url***.

```
- [
-     'id' => $this->resource->id,
-     'url' => $this->resource->url
- ];
```

- Create Image collection.

```
- php artisan make:resource ImageCollection --collection
```

- Open ***app/Http/Resources/ImageCollection.php*** file.
- Return the objects as defined in the resource.

```
- [
-     'count' => $this->collection->count(),
-     'images' => $this->collection,
- ];
```

4- Eloquent One-to-Many Relationship (Migration -> Model -> Factory -> Seeder -> Resource)

- A News article **has many** Images.
- An Image **belongs to** one News.
- Therefore, Image table (the many side) should have the foreign key from News table.
- **Image Module**
- ***Migration***
- Open ***database/migrations/timestamp_create_images_table.php*** file.
- Add the foreign key ***news_id*** from News table.

```
- $table->unsignedBigInteger('news_id')->nullable();
- $table->foreign('news_id')->references('id')->on('news')->onDelete('cascade');
```

- ***Model***
- Open ***app/Models/Image.php*** file.
- Add foreign key field ***news_id***.

```
- protected $fillable = [
-     'url',
-     'news_id'
- ];
```

- Create function to retrieve the associated record (singular).

```
- public function news() {
-     return $this->belongsTo(News::class);
- }
```

- ***Factory***
- Open ***database/factories/ImageFactory.php*** file.
- Create fake values for foreign key field ***news_id***.

```
- 'news_id' => fake()->numberBetween(1,15)
```

- ***Seeder***
- Open ***database/seeders/DatabaseSeeder.php*** file.
- Check that News fake records are created before Image recodes.
- Migrate changes to database schema.

```
- php artisan migrate
```

- [if migration failed due to an existing table, drop it from the database then re-migrate].
- Refresh migrations to empty the tables and reseed.

```
- php artisan migrate:refresh
```

- Run seeding

```
- php artisan db:seed
```

- Check database changes in MySQL (phpMyAdmin)
- ***Resource***
- Open ***app/Http/Resources/ImageResource.php*** file.
- Return only the image's ***id***, ***url*** and the associated ***article_title.***

```
- [
-     'id' => $this->resource->id,
-     'url' => $this->resource->url,
-     'article_title' => $this->resource->news->title
- ];
```

- **News Module**
- ***Model***
- Open ***app/Models/News.php*** file.
- Create function to retrieve the associated records (plural).

```
- public function images() {
-     return $this->hasMany(Image::class);
- }
```

- ***Seeder***
- Open ***database/seeders/DatabaseSeeder.php*** file.
- Check that News fake records are created before Image recodes.
- ***Resource***
- Open ***app/Http/Resources/NewsResource.php*** file.
- Return only the article's ***id***, ***title***, ***thumbnail*** and the associated ***album_size.***

```
- [
-     'id' => $this->resource->id,
-     'title' => $this->resource->title,
-     'thumbnail' => $this->resource->thumbnail,
-     'album_size' => $this->resource->images()->count(),
-     'album' => ImageResource::collection($this->images)
- ];
```

5- Eloquent Many-to-Many Relationship (Migration -> Model -> Factory -> Seeder -> Resource)

- A News article **belongs to many** Categories.
- A Category **belongs to many** News articles.
- Therefore, a third table called the **pivot table** should have two foreign keys one from News table and the another from Category table. The name of the pivot table should be the concatenation of the two table names **in the alphabetical order** i.e. CategoryNews
- **CategoryNews Module (Migration -> Model -> Factory -> Seeder)**
- Create Image model, migration, and factory.

```
php artisan make:model CategoryNews -mf
```

- The flag -mf creates factory, and migrations files in addition to model file.
- ***Migration***
- Open ***database/migrations/timestamp_create_category_news_table.php*** file.
- Add the foreign keys ***category_id*** from Category table and ***news_id*** from News table.

```
$table->unsignedBiginteger('category_id');
$table->foreign('category_id')->references('id')->on('categories')->onDelete('cascade');
$table->unsignedBiginteger('news_id');
$table->foreign('news_id')->references('id')->on('news')->onDelete('cascade');
```

- ***Model***
- Open ***app/Models/CategoryNews.php*** file.
- Add the foreign keys ***category_id*** from Category table and ***news_id*** from News table.

```
protected $fillable = [
    'category_id',
    'news_id'
];
```

- ***Factory***
- Open ***database/factories/CategoryNewsArticleFactory.php*** file.
- Create fake values for fields ***category_id*** and ***news_id***.

```
'category_id' => fake()->numberBetween(1,10),
'news_id' => fake()->numberBetween(1,20)
```

- ***Seeder***
- Open ***database/seeders/DatabaseSeeder.php*** file.
- Populate database with 50 dummy records

```
CategoryNews::factory(50)->create();
```

- Check that fake records of News and Category are created before CategoryNews recodes.
- Migrate changes to database schema.

```
php artisan migrate
```

- [if migration failed due to an existing table, drop it from the database then re-migrate].
- Refresh migrations to empty the tables and reseed.

```
php artisan migrate:refresh
```

- Run seeding

```
php artisan db:seed
```

- Check database changes in MySQL (phpMyAdmin)

- **Category Module**
- ***Model***
- Open ***app/Models/Category.php*** file.
- Create function to retrieve the associated records (plural).

```
public function news() {
    return $this->belongsToMany(News::class);
}
```

- ***Resource***
- Open ***app/Http/Resources/CategoryResource.php*** file.
- Return only the category's ***id***, ***name*** and the associated ***news_count.***

```
[
    "id" => $this->resource->id,
    "name" => $this->resource->name,
     "news_count" => $this->resource->news()->count()
];
```

- **News Module**
- ***Model***
- Open ***app/Models/News.php*** file.
- Create function to retrieve the associated records (plural).

```
public function categories() {
    return $this->belongsToMany(Category::class);
}
```

- ***Resource***
- Open ***app/Http/Resources/NewsResource.php*** file.
- Return only the article's ***id***, ***title***, ***thumbnail*** and the associated ***album_size***, ***album***, ***categories_count*** and ***categories***.

```
[
    'id' => $this->resource->id,
    'title' => $this->resource->title,
    'thumbnail' => $this->resource->thumbnail,
    'album_size' => $this->resource->images()->count(),
    'album' => ImageResource::collection($this->images),
    'categories_count' => $this->resource->categories()->count(),
    'categories' => CategoryResource::collection($this->categories)
];
```

6- Image Upload

- Open ***config/filesystems.php*** file.
- Images uploaded will be saved locally into **storage/app/public/*** and accessible from the browser from **public/storage/***.
- Create a symbolic endpoint from **public/storage** to **storage/app/public**.

```
php artisan storage:link
```

- Image file will be publicly accessible on: ***http://localhost:8000/storage/[image-path]***

7- News Module (Controller -> Route)

- ***Controller***
- Create News controller.
- php artisan make:controller NewsController --api
- Open ***app/Http/Controllers/NewsController.php*** file.
- Add the code snippet in (Appendix-I)
- ***Route***
- Create routes for News' CRUD operations.
- Open ***routes/api.php*** file.
- Add either:
- Route::resource('news', NewsController::class)
- Or
- Route::get('news', [NewsController::class, 'index'])->name('news.index');

8- Image Module (Controller -> Route)

- ***Controller***
- Create Image controller.
- php artisan make:controller ImageController --api
- Open ***app/Http/Controllers/ImageController.php*** file.
- Add the code snippet in (Appendix-II)
- ***Route***
- Create routes for Image's CRUD operations.
- Open ***routes/api.php*** file.
- Add either:
- Route::resource('album', ImageController::class)
- Or
- Route::post('album', [ImageController::class, store])->name('album.store);

9- Testing API with Postman

- Apache server is started.
- MySQL server started.
- Migrate changes to database schema.
- php artisan migrate
- Test the server running
- php artisan serve
- Open Postman
- ***http://localhost:8000/api/news/****
- ***http://localhost:8000/api/album/****
- For create, use ***Body*** -> ***form-data***
- For update, use ***Body*** -> ***x-www-form-urlencoded***

Appendix-I

NewsController.php

```php
<?php

namespace App\Http\Controllers;

use Illuminate\Http\Request;
use App\Models\Category;
use App\Http\Resources\CategoryResource;
use App\Http\Resources\CategoryCollection;
use App\Models\News;
use App\Http\Resources\NewsResource;
use App\Http\Resources\NewsCollection;
use App\Models\Image;
use Illuminate\Support\Facades\Validator;
use Exception;

class NewsController extends Controller
{
    /**
     * Display a listing of the resource.
     *
     * @return \Illuminate\Http\Response
     */
    public function index()
    {
        $articles = News::all();

        return response()->json([
            "status" => "success",
            "error" => false,
            "data" => new NewsCollection($articles),
        ],200);
    }

    public function public_index()
    {
        $articles = News::where('visible', true)->get();

        return response()->json([
            "status" => "success",
            "error" => false,
            "data" => new NewsCollection($articles),
        ],200);
    }
```

```
    /**
     * Store a newly created resource in storage.
     *
     * @param  \Illuminate\Http\Request  $request
     * @return \Illuminate\Http\Response
     */
    public function store(Request $request)
    {
        $validator = Validator::make($request->all(), [
            "title" => "required|min:3|unique:news,title",
            'thumbnail' => 'required|image|mimes:jpg,png,jpeg,gif,svg|max:2048',
        ]);

        if($validator->fails()) {
            return response()->json([
                "status" => "fail",
                "error" => true,
                "validation_errors" => $validator->errors()
            ]);
        }

        $news_id = NULL;
        try {

            $image_path = $request->file('thumbnail')-
>store('thumbnails','public');
            $article = News::create([
                "title" => $request->title,
                "body" => $request->body,
                "thumbnail" => $image_path,
                "completed" => $request->completed,
                "visible" => $request->visible,
            ]);
            $news_id = $article->id;

            if($request->categories) {
                $categories = $request->categories;
                $article->categories()->attach($categories);
            }

            if($request->images) {
                $images = $request->images;
                Image::whereIn('id', $images)->update(['news_id' => $news_id]);
                Image::where('news_id', $news_id)->whereNotIn('id', $images)-
>delete();
            }

            return response()->json([
```

```
                "status" => "success",
                "error" => false,
                "message" => "Success! news article created.",
                "data" => new NewsResource($article),
            ], 201);
        }
        catch(Exception $exception) {

            if($news_id) {
                $article = News::find($news_id);
                $article->categories()->detach();
                Image::where('news_id', $id)->delete();
                $article->delete();
            }

            return response()->json([
                "status" => "fail",
                "error" => true,
                "message" => $exception->getMessage(),
            ], 404);
        }
    }

    /**
     * Display the specified resource.
     *
     * @param  int  $id
     * @return \Illuminate\Http\Response
     */
    public function show($id)
    {
        $article = News::find($id);

        if($article) {
            return response()->json([
                "status" => "success",
                "error" => false,
                "data" => new NewsResource($article),
            ], 200);
        }

        return response()->json([
            "status" => "failed",
            "error" => true,
            "message" => "Failed! no news article found."
        ], 404);
    }
```

```php
    public function public_show($id)
    {
        $article = News::where('visible', true)->find($id);

        if($article) {
            return response()->json([
                "status" => "success",
                "error" => false,
                "data" => new NewsResource($article),
            ], 200);
        }

        return response()->json([
            "status" => "failed",
            "error" => true,
            "message" => "Failed! no news article found."
        ], 404);
    }

    /**
     * Update the specified resource in storage.
     *
     * @param  \Illuminate\Http\Request  $request
     * @param  int  $id
     * @return \Illuminate\Http\Response
     */
    public function update(Request $request, $id)
    {

        $article = News::find($id);

        if($article) {

            $validator = Validator::make($request->all(), [
                "title" => "required|min:3",
            ]);

            if($validator->fails()) {
                return response()->json([
                    "status" => "fail",
                    "error" => true,
                    "validation_errors" => $validator->errors()
                ]);
            }

            $article['title'] = $request->title;

            // if has body
```

```
            if($request->body) {
                $article['body'] = $request->body;
            }

            // if has thumbnail image
            if($request->file('thumbnail')) {
                $image_path = $request->file('thumbnail')->store('thumbnails',
'public');
                $article['thumbnail'] = $image_path;
            }

            // if has visible
            if($request->visible) {
                $article['visible'] = $request->visible;
            }

            // if has completed
            if($request->completed) {
                $article['completed'] = $request->completed;
            }

            // if has categories
            if($request->categories) {
                $categories = $request->categories;
                $article->categories()->sync($categories);
            }

            // if has album images
            if($request->images) {
                $images = $request->images;
                Image::whereIn('id', $images)->update(['news_id' => $id]);
                Image::where('news_id', $id)->whereNotIn('id', $images)-
>delete();
            }

            $article->save();
            return response()->json([
                "status" => "success",
                "error" => false,
                "message" => "Success! news article updated.",
                "data" => new NewsResource($article)
            ], 201);
        }
        return response()->json([
            "status" => "failed",
            "error" => true,
            "message" => "Failed no news article found."
        ], 404);
```

```php
    }

    /**
     * Remove the specified resource from storage.
     *
     * @param  int  $id
     * @return \Illuminate\Http\Response
     */
    public function destroy($id)
    {
        $article = News::find($id);

        if($article) {
            $article->categories()->detach();
            Image::where('news_id', $id)->delete();
            $article->delete();
            return response()->json([
                "status" => "success",
                "error" => false,
                "message" => "Success! news article deleted."
            ], 200);
        }

        return response()->json([
            "status" => "failed",
            "error" => true,
            "message" => "Failed no news article found."
        ], 404);
    }
}
```

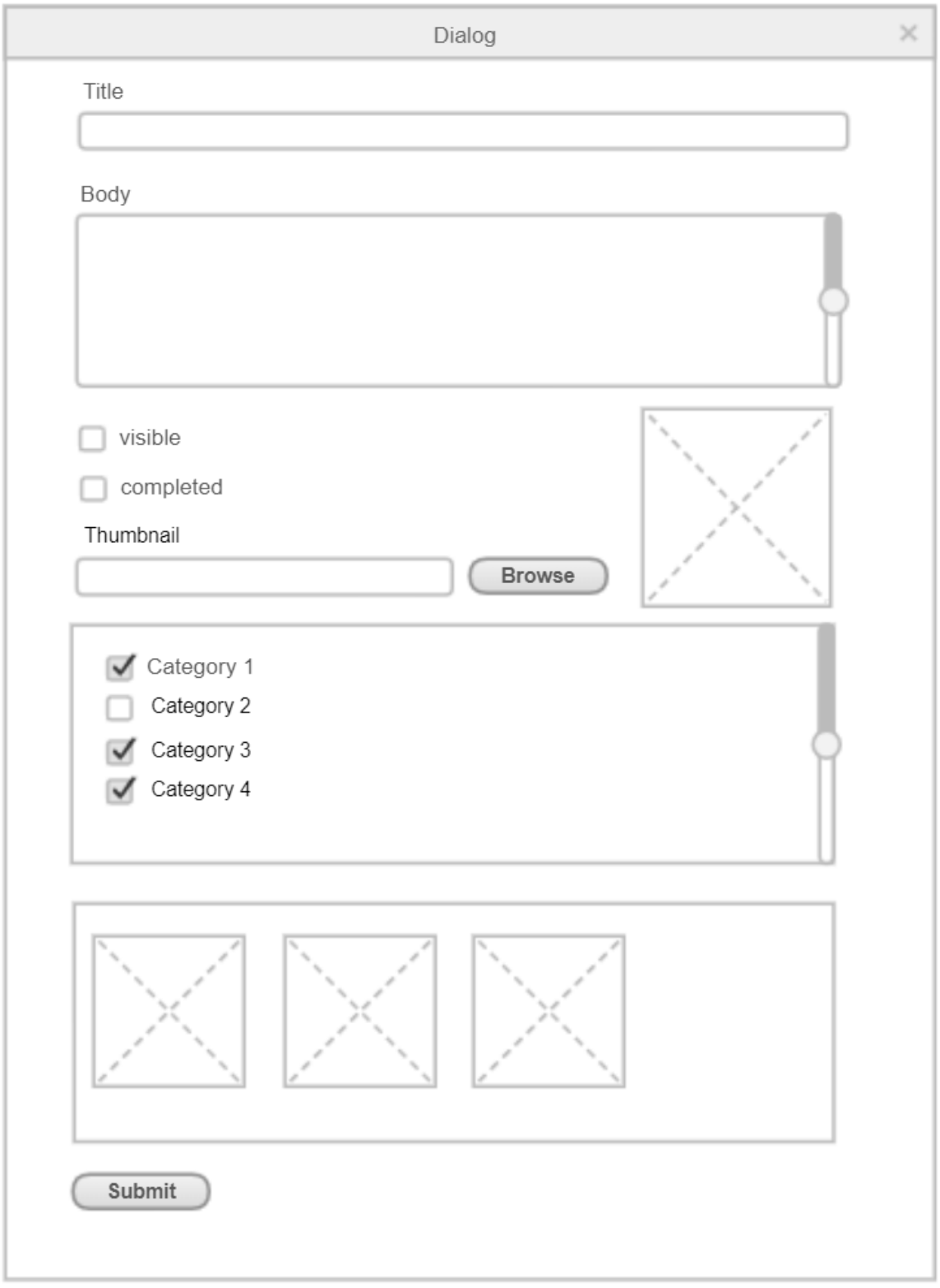
Appendix-II

ImageController.php

```php
<?php

namespace App\Http\Controllers;

use Illuminate\Http\Request;
use App\Models\Image;
use App\Http\Resources\ImageResource;
use App\Http\Resources\ImageCollection;
use Illuminate\Support\Facades\Validator;
use Exception;

class ImageController extends Controller
{
    /**
     * Display a listing of the resource.
     *
     * @return \Illuminate\Http\Response
     */
    public function index()
    {
        //
    }

    /**
     * Store a newly created resource in storage.
     *
     * @param  \Illuminate\Http\Request  $request
     * @return \Illuminate\Http\Response
     */
    public function store(Request $request)
    {
        $validator = Validator::make($request->all(), [
            'image' => 'required|image|mimes:jpg,png,jpeg,gif,svg|max:2048',
        ]);

        if($validator->fails()) {
            return response()->json([
                "status" => "fail",
                "error" => true,
                "validation_errors" => $validator->errors()
            ]);
        }

        try {
```

```
            $image_path = $request->file('image')->store('images','public');
            $image = Image::create([
                "url" => $image_path
            ]);
            return response()->json([
                "status" => "success",
                "error" => false,
                "message" => "Success! image created.",
                "data" => $image,
            ], 201);
        } catch(Exception $exception) {
            return response()->json([
                "status" => "failed",
                "error" => $exception->getMessage()
            ], 404);
        }
    }

    /**
     * Display the specified resource.
     *
     * @param  int  $id
     * @return \Illuminate\Http\Response
     */
    public function show($id)
    {
        //
    }

    /**
     * Update the specified resource in storage.
     *
     * @param  \Illuminate\Http\Request  $request
     * @param  int  $id
     * @return \Illuminate\Http\Response
     */
    public function update(Request $request, $id)
    {
        //
    }

    /**
     * Remove the specified resource from storage.
     *
     * @param  int  $id
     * @return \Illuminate\Http\Response
     */
    public function destroy($id)
```

```
    {
        $image = Image::find($id);

        if($image) {
            $image->delete();
            return response()->json([
                "status" => "success",
                "error" => false,
                 "message" => "Success! image deleted."
            ], 200);
        }
        return response()->json([
            "status" => "failed",
            "error" => true,
            "message" => "Failed no image found."
        ], 404);
    }
}
```


Dialog
Title
Body
visible
completed
Thumbnail
Browse
Category 1
Category 2
Category 3
Category 4
Submit