Bazy danych 2025

Mini projekt - boardly.

Dzień i godzina zajęć: wtorek 13:15

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AGH

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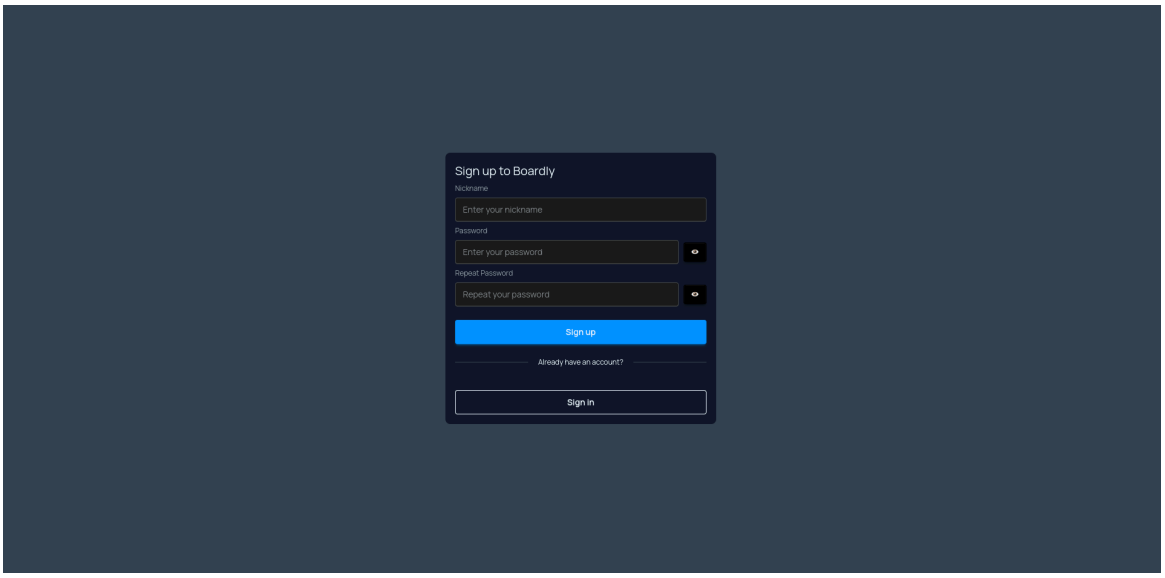
1. Funkcjonalność

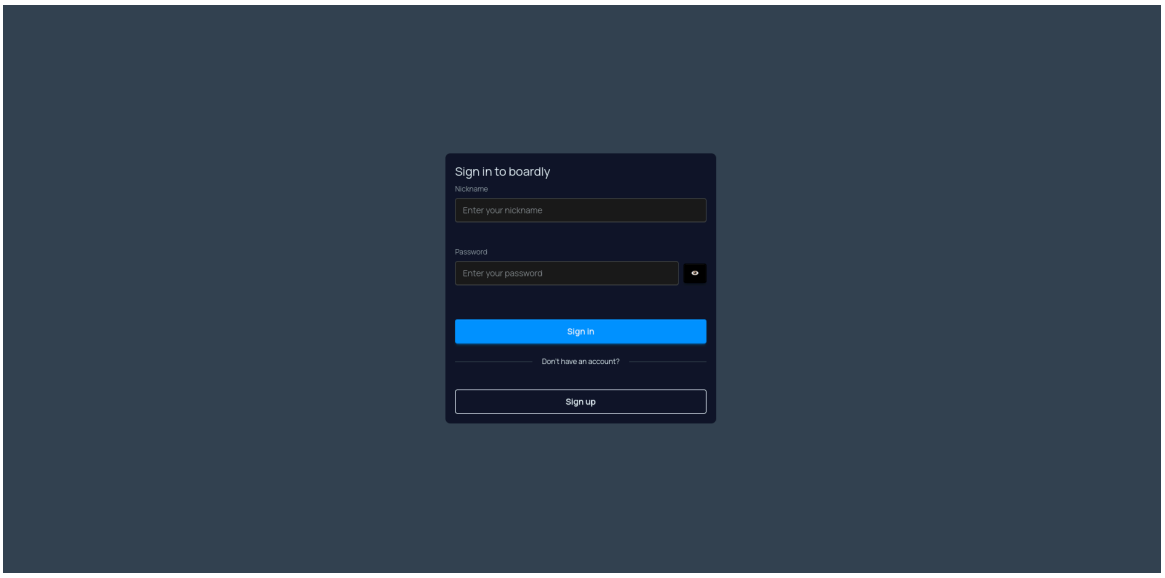
Boardly to aplikacja webowa służąca do kolaboracyjnego zarządzania projektami zgodnie z metodyką Kanban. Umożliwia tworzenie tablic projektowych, zarządzanie zadaniami w postaci kart oraz pracę zespołową w czasie rzeczywistym. Struktura aplikacji jest elastyczna i pozwala dopasować układ tablicy do potrzeb zespołu.

1.1. Zarządzanie kontem użytkownika

- **Rejestracja** – każdy użytkownik może założyć konto, podając unikalny nickname i hasło. System pilnuje, żeby nick się nie powtarzał.

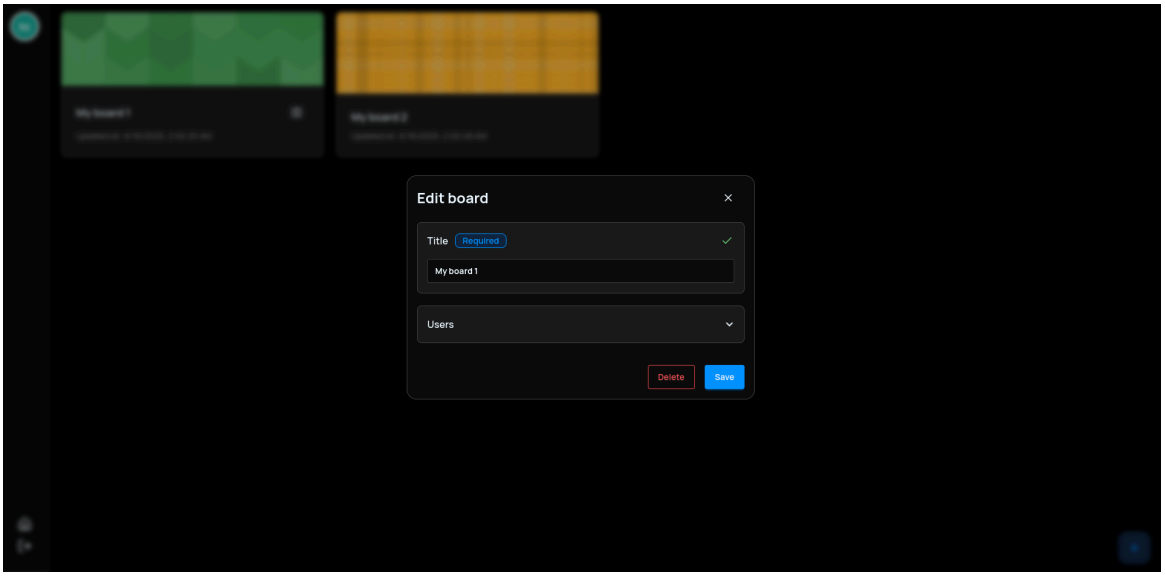


- **Logowanie** – po zalogowaniu użytkownik ma dostęp do swoich danych i tablic. Uwierzytelnianie działa w oparciu o **JWT**.

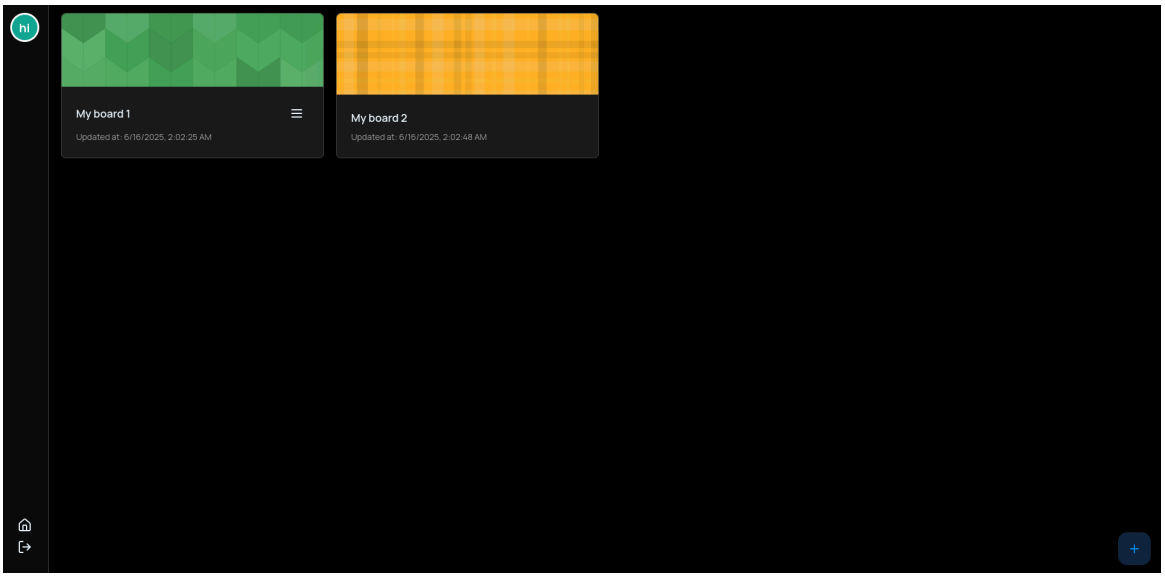


1.2. Zarządzanie tablicami

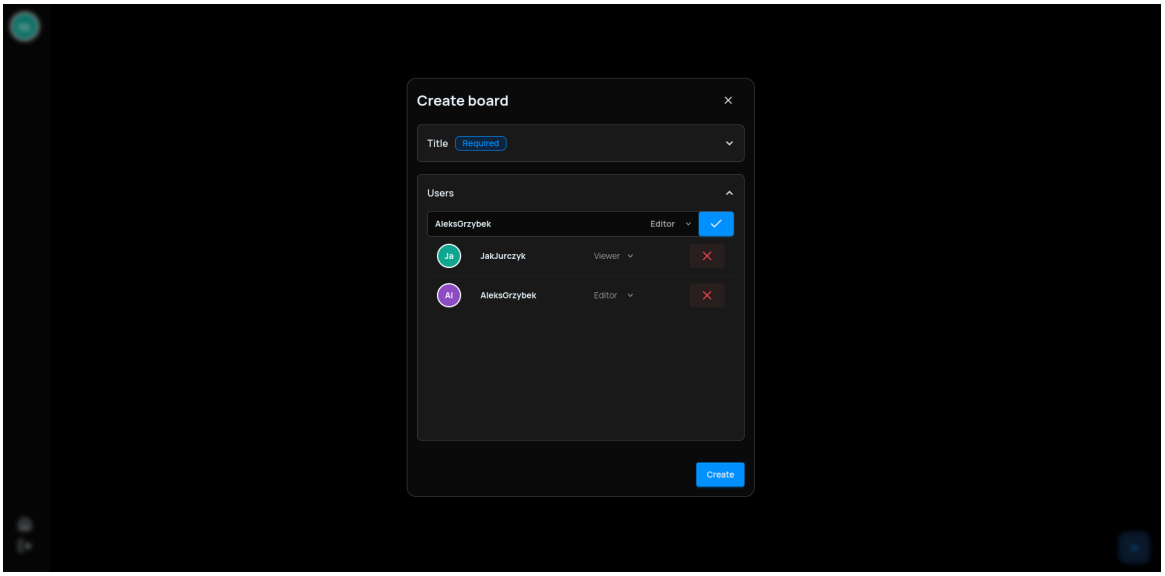
- **Tworzenie, edytowanie i usuwanie** – użytkownik może dodać nową tablicę lub edytować wcześniej przez niego stworzoną. Usunięcie tablicy usuwa też wszystkie powiązane dane (swimlanes, listy, karty).



- **Lista tablic** – po zalogowaniu użytkownik widzi wszystkie tablice, do których został przypisany.

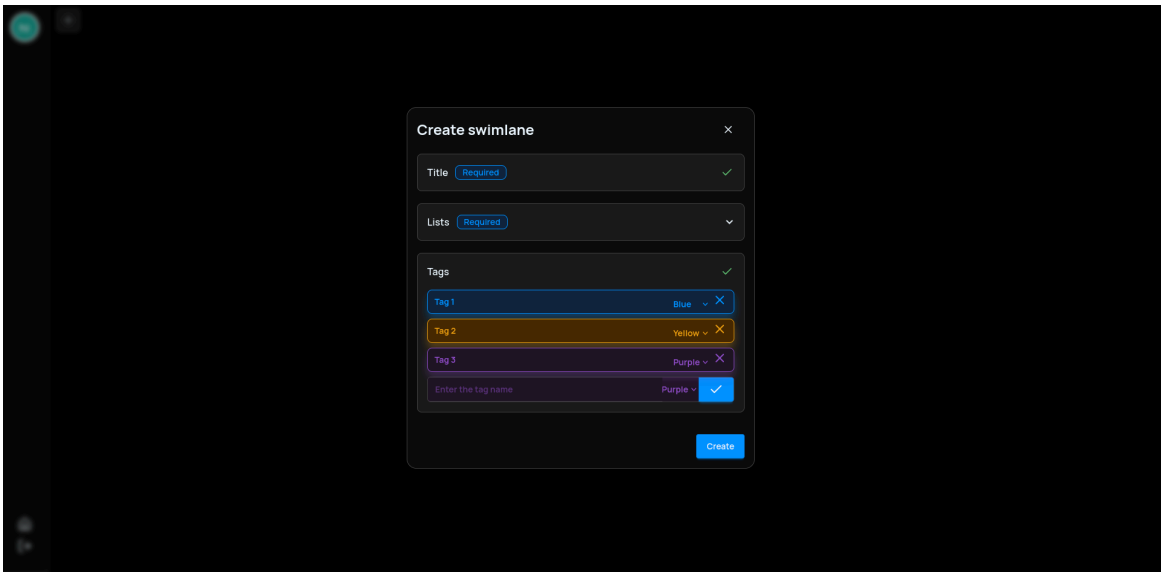


- **Członkowie tablicy** – możliwe jest dodawanie i usuwanie członków oraz zmiana ich ról i podgląd aktywności (kto aktualnie pracuje).

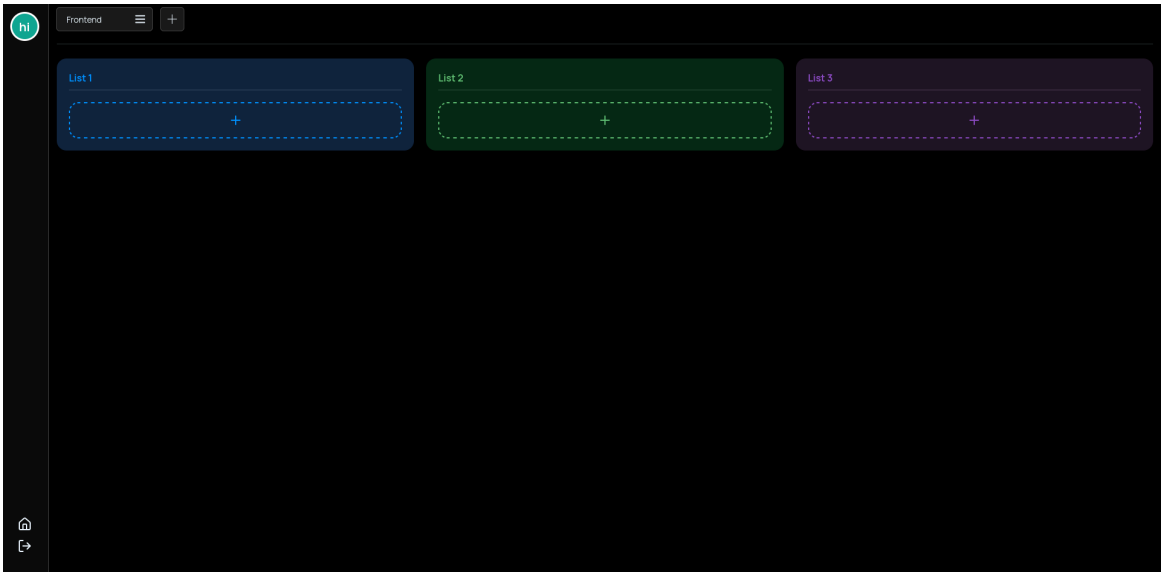


1.3. Struktura tablicy

- **Swimlanes (paski pływające)** – służą do grupowania zadań (np. „Funkcjonalności”, „Błędy”). Można je tworzyć, edytować i usuwać. Dla każdego swimlane można zdefiniować zestaw tagów, które będą dostępne do oznaczania kart w jego obrębie. Pozwala to lepiej kategoryzować i filtrować zadania.

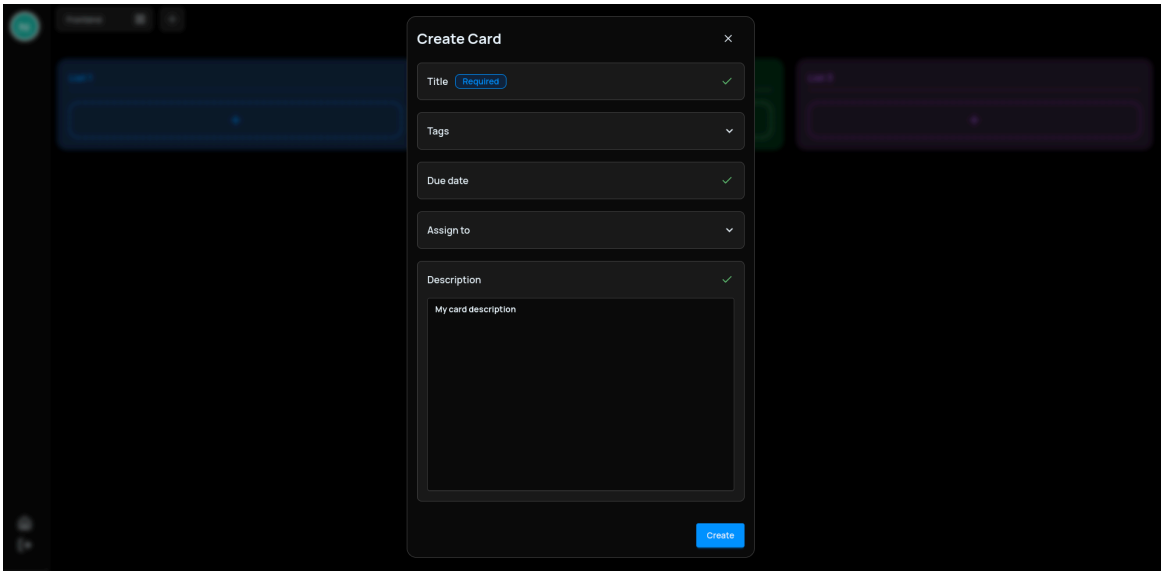


- **Listy** – znajdują się wewnątrz swimlane’ów. Oznaczają etapy pracy, np. „Do zrobienia”, „W trakcie”, „Gotowe”.

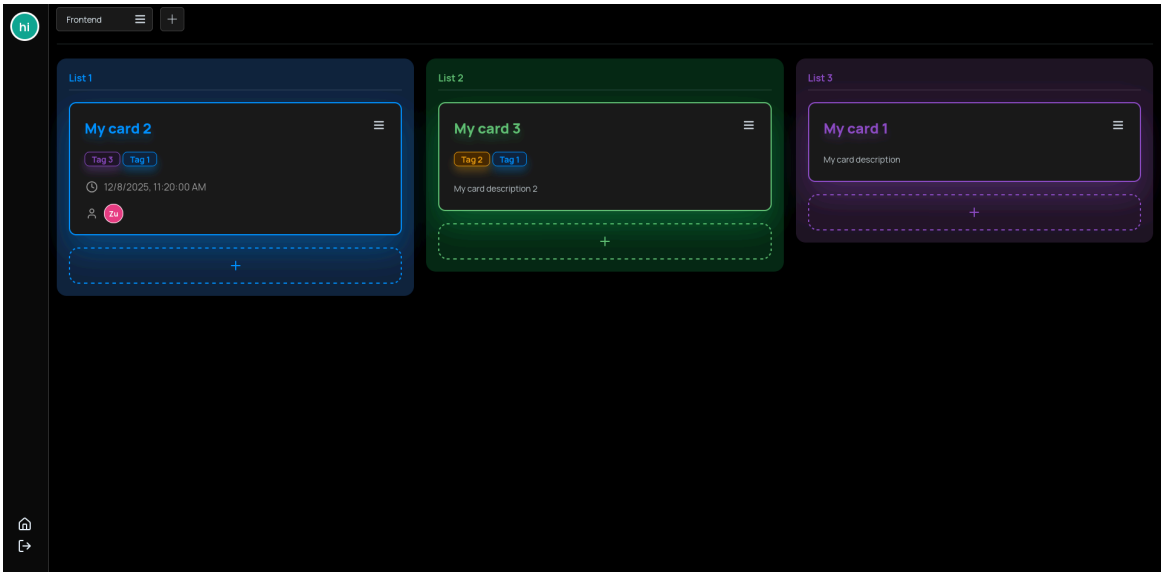


1.4. Zarządzanie zadaniami (Karty)

- **Dodawanie i usuwanie** – użytkownicy mogą tworzyć nowe karty i usuwać niepotrzebne.
- **Edycja** – każdą kartę można edytować: tytuł, opis, datę wykonania, tagi, przypisanych użytkowników.



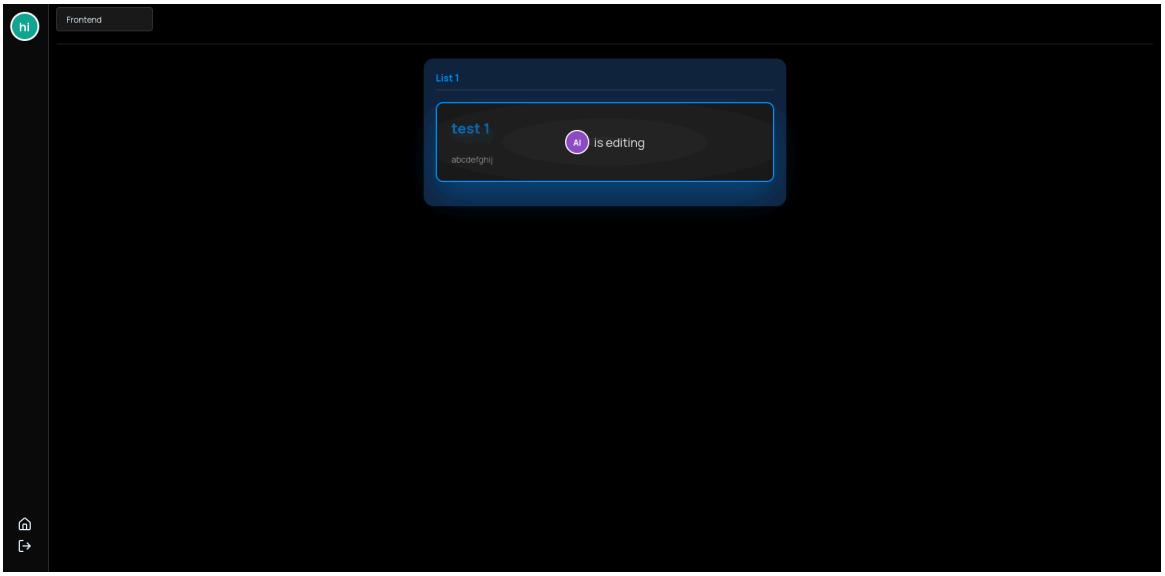
- **Przenoszenie** – karty można przeciągać między listami (drag and drop), co pozwala śledzić postęp pracy.



1.5. Współpraca w czasie rzeczywistym

Aplikacja została zbudowana z myślą o pracy zespołowej.

- **Aktualizacje w czasie rzeczywistym** – dzięki SignalR wszystkie zmiany wewnątrz tablicy są natychmiast widoczne dla pozostałych użytkowników bez odświeżania.
- **Blokowanie kart**: gdy ktoś edytuje kartę, jest ona blokowana dla innych by uniknąć konfliktów. Widać też kto aktualnie ją edytuje.



- **Ochrona przed konfliktami** (Optimistic Concurrency Control) - system śledzi wersje modyfikowanych obiektów. Jeśli użytkownik próbuje zapisać zmiany w obiekcie, który w międzyczasie został zmodyfikowany przez kogoś innego, operacja zostanie zablokowana, a użytkownik otrzyma stosowny komunikat.

2. Uprawnienia

Użytkownik może posiadać jeden z 4 stopni uprawnień. Są one indywidualne dla każdej tablicy i przechowywane w kolekcji boards. Są to kolejno:

- **Viewer** - najniższy stopień uprawnień, pozwala na:
  - Odczyt wszystkich pól z kolekcji boards i cards
  - Zmianę ListId kart, do których jest przypisany
- **Editor** - wszystkie powyższe uprawnienia, a poza tym:
  - Dodawanie, edycja i usuwanie kart, z dostępem do wszystkich ich pól
- **Admin** - wszystkie powyższe uprawnienia, a poza tym:
  - Dodawanie i usuwanie użytkowników, którzy nie mają roli **Owner**
  - Zmiana nazwy board
  - Dodawanie, usuwanie i edycja swimlane
  - Dodawanie, usuwanie i edycja list
  - Dodawanie, usuwanie i edycja tagów
- **Owner** - w jednej tablicy może być tylko jeden użytkownik o tej roli, posiada wszystkie powyższe uprawnienia, a ponadto:
  - Dodawanie i usuwanie tablicy
  - Przypisywanie roli **Owner** innemu użytkownikowi - wtedy obecny **Owner** traci uprawnienia

3. Wykorzystana technologia

Projekt podzielony jest na dwie aplikacje - Web oraz API.

- **Aplikacja Web**:
  - Język programowania: TypeScript
  - Framework: SvelteKit
  - Framework CSS: Tailwind CSS v4.1
  - Komunikacja w czasie rzeczywistym: SignalR (połączenie z API)zeczywistym
- **Aplikacja API**:
  - Język programowania: C#
  - Framework: ASP.NET
  - Wersja SDK: .NET 9.0
  - Komunikacja w czasie rzeczywistym: SignalR (połączenie z klientami)
  - Komunikacja z bazą danych: MongoDB C# Driver 3.4.0
- **Baza danych**:
  - System: MongoDB
  - Konfiguracja: Replica Set
  - Ustawienia połączenia:
    - Read concern: `snapshot`
    - Write concern: `majority`
    - Read preference: `primary`

4. Struktura bazy danych

4.1. Kolekcja tablic [boards]

```
{
  _id: ObjectId,
  title: string,
  members: [
    {
      userId: ObjectId,
      role: "Owner" | "Admin" | "Editor" | "Viewer",
      isActive: boolean
    },
    ...
  ],
  swimlanes: [
    {
      _id: ObjectId,
      title: string,
      color: "Red" | "Green" | "Blue" | "Purple" | "Yellow" | "Pink" | "Teal",
      tags: [
        {
          _id: ObjectId,
          title: string,
          color: "Red" | "Green" | "Blue" | "Purple" | "Yellow" | "Pink" | "Teal"
        },
        ...
      ],
      lists: [
        {
          _id: ObjectId,
          title: string,
          color: "Red" | "Green" | "Blue" | "Purple" | "Yellow" | "Pink" | "Teal",
          maxWIP: number | null
        },
        ...
      ]
    },
    ...
  ],
  createdAt: ISODate,
  updatedAt: ISODate
}
```

Dodatkowo:

- Tekstowy indeks na polu `title`, wspierający pełnotekstowe wyszukiwanie plansz po tytule.

4.2. Kolekcja kart [cards]

```
{
  _id: ObjectId,
  boardId: ObjectId,
  swimlaneId: ObjectId,
  listId: ObjectId,
  title: string,
  description: string | null,
  dueDate: ISODate | null,
  assignedUsers: ObjectId[],
  tags: ObjectId[],
  createdAt: ISODate,
  updatedAt: ISODate
}
```

Dodatkowo:
- Złożony indeks na `boardId`, `listId`, `swimlaneId`, przyspieszający filtrowanie kart przypisanych do konkretnego miejsca na tablicy.

4.3. Kolekcja użytkowników [users]

```
{
  _id: ObjectId,
  nickname: string,
  password: string,
  createdAt: ISODate
  updatedAt: ISODate
}
```

Dodatkowo:
- Tekstowy indeks na polu `nickname`, wspierający pełnotekstowe wyszukiwanie oraz wymuszający unikalność nicków użytkowników.

4.4. Kolekcja tokenów odświeżających [refreshTokens]

```
{
  _id: ObjectId,
  userId: ObjectId,
  token: string,
  expiresAt: ISODate
}
```

Dodatkowo:
- Indeks rosnący na polu `token`, zapewniający unikalność tokenów odświeżania.
- Indeks TTL na polu `expiresAt`, który automatycznie usuwa tokeny po ich wygaśnięciu (expireAfterSeconds: 0)

5. Zapytania bazodanowe

5.1. Tablice [boards]

5.1.1. Pobranie tablic po identyfikatorze użytkownika

```C#
public IQueryable<Board> GetRawBoardsByUserId(ObjectId userId, IClientSessionHandle? session = null)
{
    return (session == null
        ? _boardsCollection.AsQueryable()
        : _boardsCollection.AsQueryable(session))
        .Where(b => b.Members.Any(m => m.UserId == userId));
}
```

5.1.2. Pobranie tablic wraz z danymi członków po identyfikatorze użytkownika

```C#
public IQueryable<BoardWithUser> GetBoardsByUserId(ObjectId userId, IClientSessionHandle? session = null)
{
    return (session == null
        ? _boardsCollection.AsQueryable()
        : _boardsCollection.AsQueryable(session))
        .Where(b => b.Members.Any(m => m.UserId == userId))
        .SelectMany(x => x.Members.Select(member => new { Board = x, Member = member }))
        .Join(
            _usersCollection,
            x => x.Member.UserId,
            user => user.Id,
            (x, user) => new
            {
                x.Board,
                Member = new MemberWithUser
                {
                    UserId = x.Member.UserId,
                    Role = x.Member.Role,
                    IsActive = x.Member.IsActive,
                    Nickname = user.Nickname
                }
            }
        )
        .GroupBy(x => x.Board.Id)
        .Select(x => new BoardWithUser
        {
            Id = x.First().Board.Id,
            Title = x.First().Board.Title,
            CreatedAt = x.First().Board.CreatedAt,
            UpdatedAt = x.First().Board.UpdatedAt,
            Swimlanes = x.First().Board.Swimlanes,
```

```
32              Members = x.Select(m => m.Member),
33          });
34  }
```

5.1.3. Pobranie członków danej tablicy

```C#
public IQueryable<Member> GetBoardMembers(ObjectId boardId, IClientSessionHandle? session = null)
{
    return (session == null
        ? _boardsCollection.AsQueryable()
        : _boardsCollection.AsQueryable(session))
        .Where(b => b.Id == boardId)
        .SelectMany(b => b.Members);
}
```

5.1.4. Pobranie roli członka tablicy

```C#
public async Task<BoardRole?> GetUserBoardRoleAsync(ObjectId boardId, ObjectId userId,
    IClientSessionHandle? session = null, CancellationToken cancellationToken = default) =>
    (await GetBoardMembers(boardId, session).FirstOrDefaultAsync(m => m.UserId == userId,
    cancellationToken))?.Role;
```

5.1.5. Utworzenie tablicy

```C#
public async Task CreateBoardAsync(Board board, CancellationToken cancellationToken = default)
{
    if (board.Members.Count(x => x.Role == BoardRole.Owner) != 1)
        throw new ArgumentException("Board must have at least one member that is an owner.");
    await _boardsCollection.InsertOneAsync(board, cancellationToken: cancellationToken);
}
```

5.1.6. Zmiana aktywności członka tablicy

```C#
public async Task ChangeUserActivity(ObjectId id, ObjectId userId,
    bool isActive, CancellationToken cancellationToken = default)
{
    var filter = Builders<Board>.Filter.And(
        Builders<Board>.Filter.Eq(x => x.Id, id),
        Builders<Board>.Filter.ElemMatch(x=> x.Members, Builders<Member>.Filter.Eq(x =>
        x.UserId, userId)));

    var update = Builders<Board>.Update.Set("members.$.isActive", isActive);

    await _boardsCollection.UpdateOneAsync(filter, update, null, cancellationToken);
}
```

5.1.7. Aktualizacja tablicy

```C#
public async Task UpdateBoardAsync(Board board, ObjectId userId, IClientSessionHandle session, CancellationToken cancellationToken = default)
{
    IEnumerable<Member> owners = board.Members.Where(x => x.Role == BoardRole.Owner);
    if (owners.Count() != 1)
        throw new ArgumentException("Board must have exactly one member that is an owner.");
    ObjectId ownerId = owners.Single().UserId;
    var result = await _boardsCollection
        .AsQueryable(session)
        .Where(x => x.Id == board.Id)
        .Select(x => new
        {
            x.Members,
            x.UpdatedAt
        })
        .FirstOrDefaultAsync(cancellationToken)
        ?? throw new RecordDoesNotExist("Board has not been found.");
    if (board.UpdatedAt != default && board.UpdatedAt != result.UpdatedAt)
        throw new PreconditionFailedException("Board has been modified by another user since it was last read.");
    HashSet<Member> members = result.Members;
    BoardRole? role = members.FirstOrDefault(x => x.UserId == userId)?.Role;
    if (role == null || (role != BoardRole.Owner && role != BoardRole.Admin))
        throw new ForbiddenException("User is not authorized to update this board.");
    IEnumerable<Member> existingOwners = members.Where(x => x.Role == BoardRole.Owner);
    if (existingOwners.Count() != 1)
        throw new InvalidOperationException("An unexpected error occurred while updating board. Board has more or less than one owner!");
    ObjectId existingOwnerId = existingOwners.Single().UserId;
    if (existingOwnerId != ownerId && existingOwnerId != userId)
        throw new ForbiddenException("User is not authorized to change the owner of this board.");
    var newTime = DateTime.UtcNow;
    var filter = Builders<Board>.Filter.Eq(b => b.Id, board.Id);
    if (board.UpdatedAt != default)
        filter &= Builders<Board>.Filter.Eq(b => b.UpdatedAt, board.UpdatedAt);
    var update = Builders<Board>.Update
        .Set(b => b.Title, board.Title)
        .Set(b => b.Members, board.Members)
        .Set(b => b.UpdatedAt, newTime);
    UpdateResult updateResult = await _boardsCollection.UpdateOneAsync(session, filter, update, cancellationToken: cancellationToken);
    if (updateResult.MatchedCount == 0 && board.UpdatedAt != default)
        throw new PreconditionFailedException("Board has been modified by another user since it was last read.");
    else if (updateResult.MatchedCount != 0 && updateResult.ModifiedCount == 0)
```

```
41            throw new InvalidOperationException("An unexpected error occurred while updating
              board. Board has not been modified.");
42        board.UpdatedAt = newTime;
43    }
```

5.1.8. Aktualizacja tablicy wraz z jej zwrotem po aktualizacji z dołączonymi danymi członków

```C#
1   public async Task<BoardWithUser> UpdateAndFindBoardAsync(Board board, ObjectId userId,
    CancellationToken cancellationToken = default)
2   {
3       using var session = await _mongoClient.StartSessionAsync(cancellationToken:
        cancellationToken);
4       return await session.WithTransactionAsync(async (s, ct) =>
5       {
6           await UpdateBoardAsync(board, userId, s, ct);
7           return await GetBoardsByUserId(userId, s).SingleAsync(b => b.Id == board.Id, ct);
8       }, cancellationToken: cancellationToken);
9   }
```

5.1.9. Usunięcie tablicy

```C#
1   public async Task DeleteBoardAsync(ObjectId id, ObjectId userId, DateTime updatedAt =
    default, CancellationToken cancellationToken = default)
2   {
3       using var session = await _mongoClient.StartSessionAsync(cancellationToken:
        cancellationToken);
4       await session.WithTransactionAsync(async (s, ctx) =>
5       {
6           var result = await _boardsCollection
7               .AsQueryable(s)
8               .Where(x => x.Id == id)
9               .Select(x => new
10              {
11                  Member = x.Members.FirstOrDefault(m => m.UserId == userId),
12                  x.UpdatedAt
13              })
14              .FirstOrDefaultAsync(ctx)
15              ?? throw new RecordDoesNotExist("Board has not been found.");
16          if (updatedAt != default && updatedAt != result.UpdatedAt)
17              throw new PreconditionFailedException("Board has been modified by another user
                since it was last read.");
18          if (result.Member?.Role != BoardRole.Owner)
19              throw new ForbiddenException("User is not authorized to delete this board.");
20          var filter = Builders<Board>.Filter.Eq(b => b.Id, id);
21          if (updatedAt != default)
22              filter &= Builders<Board>.Filter.Eq(b => b.UpdatedAt, updatedAt);
23          DeleteResult deleteResult = await _boardsCollection.DeleteOneAsync(s, filter,
            cancellationToken: ctx);
24          if (deleteResult.DeletedCount == 0 && updatedAt != default)
```

```
25                 throw new PreconditionFailedException("Board has been modified by another user
                   since it was last read.");
26             await _cardsCollection.DeleteManyAsync(s, x => x.BoardId == id, cancellationToken:
               ctx);
27             return Task.CompletedTask;
28         }, cancellationToken: cancellationToken);
29     }
```

5.2. Paski pływające [swimlanes]

5.2.1. Pobranie pasków wszystkich pasków pływających danej tablicy

```
1  public IQueryable<Swimlane> GetSwimlanesByBoardId(ObjectId boardId, IClientSessionHandle?
   session = null)                                                                          C#
2  {
3      return (session == null
4          ? _boardsCollection.AsQueryable()
5          : _boardsCollection.AsQueryable(session))
6          .Where(b => b.Id == boardId)
7          .SelectMany(b => b.Swimlanes);
8  }
```

5.2.2. Utworzenie paska pływającego

```
1  public async Task<DateTime> CreateSwimlaneAsync(ObjectId boardId, ObjectId userId,
   Swimlane swimlane,                                                                       C#
2      IClientSessionHandle session, DateTime updatedAt = default, CancellationToken
       cancellationToken = default)
3  {
4      var result = await _boardsCollection
5          .AsQueryable(session)
6          .Where(x => x.Id == boardId)
7          .Select(x => new
8          {
9              Member = x.Members.FirstOrDefault(m => m.UserId == userId),
10             x.UpdatedAt
11         })
12         .FirstOrDefaultAsync(cancellationToken)
13         ?? throw new RecordDoesNotExist("Board has not been found.");
14     if (updatedAt != default && updatedAt != result.UpdatedAt)
15         throw new PreconditionFailedException("Board has been modified by another user since
           it was last read.");
16     if (result.Member?.Role != BoardRole.Owner && result.Member?.Role != BoardRole.Admin)
17         throw new ForbiddenException("User is not authorized to create a swimlane on this
           board.");
18     var filter = Builders<Board>.Filter.Eq(b => b.Id, boardId);
19     if (updatedAt != default)
20         filter &= Builders<Board>.Filter.Eq(b => b.UpdatedAt, updatedAt);
21     var now = DateTime.UtcNow;
22     var update = Builders<Board>.Update
```

```
23          .Push(b => b.Swimlanes, swimlane)
24          .Set(b => b.UpdatedAt, now);
25      UpdateResult updateResult = await _boardsCollection.UpdateOneAsync(session, filter,
        update, cancellationToken: cancellationToken);
26      if (updatedAt != default && updateResult.MatchedCount == 0)
27          throw new PreconditionFailedException("Board has been modified by another user since
            it was last read.");
28      if (updateResult.MatchedCount != 0 && updateResult.ModifiedCount == 0)
29          throw new InvalidOperationException("An unexpected error occurred while creating
            swimlane. Board has not been modified.");
30      return now;
31  }
```

5.2.3. Utworzenie paska pływającego wraz z jego zwrotem po utworzeniu

```C#
1   public async Task<(Swimlane, DateTime)> CreateAndFindSwimlaneAsync(ObjectId boardId,
    ObjectId userId,
2       Swimlane swimlane, DateTime updatedAt = default, CancellationToken cancellationToken =
        default)
3   {
4       using var session = await _mongoClient.StartSessionAsync(cancellationToken:
        cancellationToken);
5       return await session.WithTransactionAsync(async (s, ctx) =>
6       {
7           var newUpdatedAt = await CreateSwimlaneAsync(boardId, userId, swimlane, s, updatedAt,
            ctx);
8           return (await GetSwimlanesByBoardId(boardId, s).SingleAsync(s => s.Id == swimlane.Id,
            ctx), newUpdatedAt);
9       }, cancellationToken: cancellationToken);
10  }
```

5.2.4. Aktualizacja paska pływającego

```C#
1   public async Task<DateTime> UpdateSwimlaneAsync(ObjectId boardId, ObjectId userId,
    Swimlane swimlane,
2       IClientSessionHandle session, DateTime updatedAt = default, CancellationToken
        cancellationToken = default)
3   {
4       var result = await _boardsCollection
5           .AsQueryable(session)
6           .Where(b => b.Id == boardId)
7           .Select(b => new
8           {
9               Member = b.Members.FirstOrDefault(m => m.UserId == userId),
10              Swimlane = b.Swimlanes.FirstOrDefault(s => s.Id == swimlane.Id),
11              b.UpdatedAt
12          })
13          .FirstOrDefaultAsync(cancellationToken)
14          ?? throw new RecordDoesNotExist("Board has not been found.");
15      if (updatedAt != default && updatedAt != result.UpdatedAt)
```

```
16          throw new PreconditionFailedException("Board has been modified by another user since
            it was last read.");
17      if (result.Member == null)
18          throw new ForbiddenException("User is not a member of this board.");
19      if (result.Member.Role != BoardRole.Owner && result.Member.Role != BoardRole.Admin)
20          throw new ForbiddenException("User is not authorized to update a swimlane on this
            board.");
21      if (result.Swimlane == null)
22          throw new RecordDoesNotExist("Swimlane has not been found.");
23      var filter = Builders<Board>.Filter.Eq(b => b.Id, boardId);
24      if (updatedAt != default)
25          filter &= Builders<Board>.Filter.Eq(b => b.UpdatedAt, updatedAt);
26      var now = DateTime.UtcNow;
27      var update = Builders<Board>.Update
28          .Set("swimlanes.$[sw].title", swimlane.Title)
29          .Set("swimlanes.$[sw].color", swimlane.Color)
30          .Set(b => b.UpdatedAt, now);
31      var arrayFilters = new List<ArrayFilterDefinition>
32      {
33          new BsonDocumentArrayFilterDefinition<BsonDocument>(new BsonDocument("sw._id",
            swimlane.Id)),
34      };
35      var updateOptions = new UpdateOptions { ArrayFilters = arrayFilters };
36      UpdateResult updateResult = await _boardsCollection.UpdateOneAsync(session, filter,
        update, updateOptions, cancellationToken);
37      if (updatedAt != default && updateResult.MatchedCount == 0)
38          throw new PreconditionFailedException("Board has been modified by another user since
            it was last read.");
39      if (updateResult.MatchedCount != 0 && updateResult.ModifiedCount == 0)
40          throw new InvalidOperationException("An unexpected error occurred while updating
            swimlane. Board has not been modified.");
41      return now;
42  }
```

5.2.5. Aktualizacja paska pływającego wraz z jego zwrotem po aktualizacji

```
1   public async Task<(Swimlane, DateTime)> UpdateAndFindSwimlaneAsync(ObjectId boardId,
    ObjectId userId,                                                                    C#
2       Swimlane swimlane, DateTime updatedAt = default, CancellationToken cancellationToken =
        default)
3   {
4       using var session = await _mongoClient.StartSessionAsync(cancellationToken:
        cancellationToken);
5       return await session.WithTransactionAsync(async (s, ctx) =>
6       {
7           var newUpdatedAt = await UpdateSwimlaneAsync(boardId, userId, swimlane, s, updatedAt,
            ctx);
8           return (await GetSwimlanesByBoardId(boardId, s).SingleAsync(s => s.Id == swimlane.Id,
            ctx), newUpdatedAt);
```

```
9       }, cancellationToken: cancellationToken);
10  }
```

5.2.6. Usunięcie paska pływającego

```C#
1   public async Task<DateTime> DeleteSwimlaneAsync(ObjectId boardId, ObjectId swimlaneId,
2       ObjectId userId, DateTime updatedAt = default, CancellationToken cancellationToken =
        default)
3   {
4       using var session = await _mongoClient.StartSessionAsync(cancellationToken:
        cancellationToken);
5       return await session.WithTransactionAsync(async (s, ctx) =>
6       {
7           var result = await _boardsCollection
8               .AsQueryable(s)
9               .Where(b => b.Id == boardId)
10              .Select(b => new
11              {
12                  Swimlane = b.Swimlanes.FirstOrDefault(s => s.Id == swimlaneId),
13                  Member = b.Members.FirstOrDefault(m => m.UserId == userId),
14                  b.UpdatedAt
15              })
16              .FirstOrDefaultAsync(ctx)
17              ?? throw new RecordDoesNotExist("Board has not been found.");
18          if (updatedAt != default && updatedAt != result.UpdatedAt)
19              throw new PreconditionFailedException("Board has been modified by another user
                since it was last read.");
20          if (result.Member?.Role != BoardRole.Owner && result.Member?.Role != BoardRole.Admin)
21              throw new ForbiddenException("User is not authorized to delete this swimlane.");
22          if (result.Swimlane == null)
23              throw new RecordDoesNotExist("Swimlane has not been found.");
24          var filter = Builders<Board>.Filter.Eq(b => b.Id, boardId);
25          if (updatedAt != default)
26              filter &= Builders<Board>.Filter.Eq(b => b.UpdatedAt, updatedAt);
27          var now = DateTime.UtcNow;
28          var update = Builders<Board>.Update
29              .Set(b => b.UpdatedAt, now)
30              .PullFilter(b => b.Swimlanes, Builders<Swimlane>.Filter.Eq(s => s.Id, swimlaneId)
31          );
32          UpdateResult updateResult = await _boardsCollection.UpdateOneAsync(s, filter, update,
            cancellationToken: ctx);
33          if (updatedAt != default && updateResult.MatchedCount == 0)
34              throw new PreconditionFailedException("Board has been modified by another user
                since it was last read.");
35          if (updateResult.MatchedCount != 0 && updateResult.ModifiedCount == 0)
36              throw new InvalidOperationException("An unexpected error occurred while deleting
                swimlane. Board has not been modified.");
```

```
37          await _cardsCollection.DeleteManyAsync(s, x => x.SwimlaneId == swimlaneId,
            cancellationToken: ctx);
38          return now;
39      }, cancellationToken: cancellationToken);
40  }
```

5.3. Listy [lists]

5.3.1. Pobranie wszystkich list paska pływającego

```C#
1  public IQueryable<List> GetListsBySwimlaneId(ObjectId boardId, ObjectId swimlaneId,
   IClientSessionHandle? session = null)
2  {
3      return (session == null
4          ? _boardsCollection.AsQueryable()
5          : _boardsCollection.AsQueryable(session))
6          .Where(b => b.Id == boardId)
7          .SelectMany(b => b.Swimlanes.Where(s => s.Id == swimlaneId).SelectMany(s => s.Lists));
8  }
```

5.3.2. Utworzenie nowej listy

```C#
1   public async Task<DateTime> CreateListAsync(ObjectId boardId, ObjectId swimlaneId,
    ObjectId userId, List list,
2       IClientSessionHandle session, DateTime updatedAt = default, CancellationToken
        cancellationToken = default)
3   {
4       var result = await _boardsCollection
5           .AsQueryable(session)
6           .Where(b => b.Id == boardId)
7           .Select(b => new
8           {
9               Member = b.Members.FirstOrDefault(m => m.UserId == userId),
10              b.UpdatedAt
11          })
12          .FirstOrDefaultAsync(cancellationToken)
13          ?? throw new RecordDoesNotExist("Board has not been found.");
14      if (updatedAt != default && updatedAt != result.UpdatedAt)
15          throw new PreconditionFailedException("Board has been modified by another user since
            it was last read.");
16      if (result.Member?.Role != BoardRole.Owner && result.Member?.Role != BoardRole.Admin)
17          throw new ForbiddenException("User is not authorized to create a list on this
            board.");
18
19      var filter = Builders<Board>.Filter.Eq(b => b.Id, boardId);
20      if (updatedAt != default)
21          filter &= Builders<Board>.Filter.Eq(b => b.UpdatedAt, updatedAt);
22      var now = DateTime.UtcNow;
23      var update = Builders<Board>.Update
24          .Push("swimlanes.$[sw].lists", list)
```

```
25          .Set(b => b.UpdatedAt, now);
26
27      var arrayFilters = new List<ArrayFilterDefinition>
28      {
29          new BsonDocumentArrayFilterDefinition<BsonDocument>(new BsonDocument("sw._id",
            swimlaneId))
30      };
31      var updateOptions = new UpdateOptions { ArrayFilters = arrayFilters };
32
33      var updateResult = await _boardsCollection.UpdateOneAsync(session, filter, update,
        updateOptions, cancellationToken);
34
35      if (updatedAt != default && updateResult.MatchedCount == 0)
36          throw new PreconditionFailedException("Board has been modified by another user since
            it was last read.");
37      if (updateResult.MatchedCount != 0 && updateResult.ModifiedCount == 0)
38          throw new InvalidOperationException("An unexpected error occurred while creating list.
            Board has not been modified.");
39      return now;
40  }
```

5.3.3. Utworzenie nowej listy wraz z jej zwrotem po utworzeniu

```C#
1   public async Task<(List, DateTime)> CreateAndFindListAsync(ObjectId boardId, ObjectId
    swimlaneId, ObjectId userId,
2       List list, DateTime updatedAt = default, CancellationToken cancellationToken = default)
3   {
4       using var session = await _mongoClient.StartSessionAsync(cancellationToken:
        cancellationToken);
5       return await session.WithTransactionAsync(async (s, ctx) =>
6       {
7           var newUpdatedAt = await CreateListAsync(boardId, swimlaneId, userId, list, s,
            updatedAt, ctx);
8           return (await GetListBySwimlaneId(boardId, swimlaneId, s).SingleAsync(s => s.Id ==
            list.Id, ctx), newUpdatedAt);
9       }, cancellationToken: cancellationToken);
10  }
```

5.3.4. Aktualizacja listy

```C#
1   public async Task<DateTime> UpdateListAsync(ObjectId boardId, ObjectId swimlaneId,
    ObjectId userId, List list,
2       IClientSessionHandle session, DateTime updatedAt = default, CancellationToken
        cancellationToken = default)
3   {
4       var result = await _boardsCollection
5           .AsQueryable(session)
6           .Where(b => b.Id == boardId)
7           .Select(b => new
8           {
```

```
9               Member = b.Members.FirstOrDefault(m => m.UserId == userId),
10              List = b.Swimlanes.Where(s => s.Id == swimlaneId).Select(s =>
                s.Lists.FirstOrDefault(l => l.Id == list.Id)).FirstOrDefault(),
11              b.UpdatedAt
12          }).FirstOrDefaultAsync(cancellationToken)
13          ?? throw new RecordDoesNotExist("Board has not been found.");
14      if (updatedAt != default && updatedAt != result.UpdatedAt)
15          throw new PreconditionFailedException("Board has been modified by another user since
            it was last read.");
16      if (result.Member?.Role != BoardRole.Owner && result.Member?.Role != BoardRole.Admin)
17          throw new ForbiddenException("User is not authorized to update a list on this
            board.");
18      if (result.List == null)
19          throw new RecordDoesNotExist("List has not been found.");
20      var filter = Builders<Board>.Filter.Eq(b => b.Id, boardId);
21      if (updatedAt != default)
22          filter &= Builders<Board>.Filter.Eq(b => b.UpdatedAt, updatedAt);
23      var now = DateTime.UtcNow;
24      var update = Builders<Board>.Update
25          .Set("swimlanes.$[sw].lists.$[lst].title", list.Title)
26          .Set("swimlanes.$[sw].lists.$[lst].color", list.Color)
27          .Set("swimlanes.$[sw].lists.$[lst].maxWIP", list.MaxWIP)
28          .Set(b => b.UpdatedAt, now);
29      var arrayFilters = new List<ArrayFilterDefinition>
30      {
31          new BsonDocumentArrayFilterDefinition<BsonDocument>(new BsonDocument("sw._id",
            swimlaneId)),
32          new BsonDocumentArrayFilterDefinition<BsonDocument>(new BsonDocument("lst._id",
            list.Id))
33      };
34      var updateOptions = new UpdateOptions { ArrayFilters = arrayFilters };
35      var updateResult = await _boardsCollection.UpdateOneAsync(session, filter, update,
        updateOptions, cancellationToken);
36      if (updatedAt != default && updateResult.MatchedCount == 0)
37          throw new PreconditionFailedException("Board has been modified by another user since
            it was last read.");
38      if (updateResult.MatchedCount != 0 && updateResult.ModifiedCount == 0)
39          throw new InvalidOperationException("An unexpected error occurred while updating list.
            Board has not been modified.");
40      return now;
41  }
```

5.3.5. Aktualizacja listy wraz z jej zwrotem po aktualizacji

```C#
1   public async Task<(List, DateTime)> UpdateAndFindListAsync(ObjectId boardId, ObjectId
    swimlaneId, ObjectId userId,
2       List list, DateTime updatedAt = default, CancellationToken cancellationToken = default)
3   {
```

```
    using var session = await _mongoClient.StartSessionAsync(cancellationToken:
    cancellationToken);
    return await session.WithTransactionAsync(async (s, ctx) =>
    {
        var newUpdatedAt = await UpdateListAsync(boardId, swimlaneId, userId, list, s,
        updatedAt, ctx);
        return (await GetListBySwimlaneId(boardId, swimlaneId, s).SingleAsync(s => s.Id ==
        list.Id, ctx), newUpdatedAt);
    }, cancellationToken: cancellationToken);
}
```

5.3.6. Usunięcie listy

```C#
public async Task<DateTime> DeleteListAsync(ObjectId boardId, ObjectId swimlaneId,
ObjectId listId, ObjectId userId,
    DateTime updatedAt = default, CancellationToken cancellationToken = default)
{
    using var session = await _mongoClient.StartSessionAsync(cancellationToken:
    cancellationToken);
    return await session.WithTransactionAsync(async (s, ctx) =>
    {
        var result = await _boardsCollection
            .AsQueryable(s)
            .Where(b => b.Id == boardId)
            .Select(b => new
            {
                List = b.Swimlanes.Where(s => s.Id == swimlaneId).Select(s =>
                s.Lists.FirstOrDefault(l => l.Id == listId)).FirstOrDefault(),
                Member = b.Members.FirstOrDefault(m => m.UserId == userId),
                b.UpdatedAt
            })
            .FirstOrDefaultAsync(ctx)
            ?? throw new RecordDoesNotExist("Board has not been found.");
        if (updatedAt != default && updatedAt != result.UpdatedAt)
            throw new PreconditionFailedException("Board has been modified by another user
            since it was last read.");
        if (result.Member?.Role != BoardRole.Owner && result.Member?.Role != BoardRole.Admin)
            throw new ForbiddenException("User is not authorized to delete this list.");
        if (result.List == null)
            throw new RecordDoesNotExist("List has not been found.");
        var filter = Builders<Board>.Filter.Eq(b => b.Id, boardId);
        if (updatedAt != default)
            filter &= Builders<Board>.Filter.Eq(b => b.UpdatedAt, updatedAt);
        var now = DateTime.UtcNow;
        var update = Builders<Board>.Update.PullFilter(
            "swimlanes.$[sw].lists",
            Builders<BsonDocument>.Filter.Eq("_id", listId))
            .Set(b => b.UpdatedAt, now);
```

```
32          var arrayFilters = new List<ArrayFilterDefinition>
33          {
34              new BsonDocumentArrayFilterDefinition<BsonDocument>(new BsonDocument("sw._id",
                swimlaneId))
35          };
36          var updateOptions = new UpdateOptions { ArrayFilters = arrayFilters };
37          UpdateResult updateResult = await _boardsCollection.UpdateOneAsync(s, filter, update,
                updateOptions, ctx);
38          if (updatedAt != default && updateResult.MatchedCount == 0)
39              throw new PreconditionFailedException("Board has been modified by another user
                since it was last read.");
40          if (updateResult.MatchedCount != 0 && updateResult.ModifiedCount == 0)
41              throw new InvalidOperationException("An unexpected error occurred while deleting
                list. Board has not been modified.");
42          await _cardsCollection.DeleteManyAsync(s, x => x.ListId == listId, cancellationToken:
                ctx);
43          return now;
44      }, cancellationToken: cancellationToken);
45  }
```

5.4. Tagi [tags]

5.4.1. Pobranie wszystkich tagów z paska pływającego

```C#
1  public IQueryable<Entities.Board.Tag> GetTagsBySwimlaneIdAsync(ObjectId boardId, ObjectId
   swimlaneId, IClientSessionHandle? session = null)
2  {
3      return (session == null
4          ? _boardsCollection.AsQueryable()
5          : _boardsCollection.AsQueryable(session))
6          .Where(b => b.Id == boardId)
7          .SelectMany(b => b.Swimlanes
8              .Where(s => s.Id == swimlaneId)
9              .SelectMany(s => s.Tags));
10 }
```

5.4.2. Utworzenie nowego taga

```C#
1  public async Task<DateTime> CreateTagAsync(ObjectId boardId, ObjectId swimlaneId, ObjectId
   userId, Entities.Board.Tag tag,
2      IClientSessionHandle session, DateTime updatedAt = default, CancellationToken
       cancellationToken = default)
3  {
4      var result = await _boardsCollection
5          .AsQueryable(session)
6          .Where(b => b.Id == boardId)
7          .Select(x => new
8          {
9              Member = x.Members.FirstOrDefault(m => m.UserId == userId),
10             x.UpdatedAt
```

```
11          })
12          .FirstOrDefaultAsync(cancellationToken)
13          ?? throw new RecordDoesNotExist("Board has not been found.");
14      if (updatedAt != default && updatedAt != result.UpdatedAt)
15          throw new PreconditionFailedException("Board has been modified by another user since
            it was last read.");
16      if (result.Member?.Role != BoardRole.Owner && result.Member?.Role != BoardRole.Admin)
17          throw new ForbiddenException("User is not authorized to create a tag on this board.");
18      var filter = Builders<Board>.Filter.Eq(b => b.Id, boardId);
19      if (updatedAt != default)
20          filter &= Builders<Board>.Filter.Eq(b => b.UpdatedAt, updatedAt);
21      var now = DateTime.UtcNow;
22      var update = Builders<Board>.Update
23          .Push("swimlanes.$[sw].tags", tag)
24          .Set(b => b.UpdatedAt, now);
25
26      var arrayFilters = new List<ArrayFilterDefinition>
27      {
28          new BsonDocumentArrayFilterDefinition<BsonDocument>(new BsonDocument("sw._id",
            swimlaneId))
29      };
30      var updateOptions = new UpdateOptions { ArrayFilters = arrayFilters };
31
32      var updateResult = await _boardsCollection.UpdateOneAsync(session, filter, update,
        updateOptions, cancellationToken);
33
34      if (updatedAt != default && updateResult.MatchedCount == 0)
35          throw new PreconditionFailedException("Board has been modified by another user since
            it was last read.");
36      if (updateResult.MatchedCount != 0 && updateResult.ModifiedCount == 0)
37          throw new InvalidOperationException("An unexpected error occurred while creating tag.
            Board has not been modified.");
38      return now;
39  }
```

5.4.3. Utworzenie nowego taga wraz z jego zwrotem po utworzeniu

```C#
1   public async Task<(Entities.Board.Tag, DateTime)> CreateAndFindTagAsync(ObjectId boardId,
    ObjectId swimlaneId,
2       ObjectId userId, Entities.Board.Tag tag, DateTime updatedAt = default, CancellationToken
        cancellationToken = default)
3   {
4       using var session = await _mongoClient.StartSessionAsync(cancellationToken:
        cancellationToken);
5       return await session.WithTransactionAsync(async (s, ctx) =>
6       {
7           var newUpdatedAt = await CreateTagAsync(boardId, swimlaneId, userId, tag, s,
            updatedAt, ctx);
```

```
8           return (await GetTagsBySwimlaneIdAsync(boardId, swimlaneId, s).SingleAsync(t => t.Id
            == tag.Id, ctx), newUpdatedAt);
9       }, cancellationToken: cancellationToken);
10  }
```

5.4.4. Aktualizacja taga

```C#
1   public async Task<DateTime> UpdateTagAsync(ObjectId boardId, ObjectId swimlaneId, ObjectId
    userId, Entities.Board.Tag tag,
2       IClientSessionHandle session, DateTime updatedAt = default, CancellationToken
        cancellationToken = default)
3   {
4       var result = await _boardsCollection
5           .AsQueryable(session)
6           .Where(b => b.Id == boardId)
7           .Select(x => new
8           {
9               Member = x.Members.FirstOrDefault(x => x.UserId == userId),
10              Swimlane = x.Swimlanes.FirstOrDefault(x => x.Id == swimlaneId),
11              x.UpdatedAt
12          }).FirstOrDefaultAsync(cancellationToken)
13          ?? throw new RecordDoesNotExist("Board has not been found.");
14      if (updatedAt != default && updatedAt != result.UpdatedAt)
15          throw new PreconditionFailedException("Board has been modified by another user since
            it was last read.");
16      if (result.Member?.Role != BoardRole.Owner && result.Member?.Role != BoardRole.Admin)
17          throw new ForbiddenException("User is not authorized to update a tag on this board.");
18      if (result.Swimlane == null)
19          throw new RecordDoesNotExist("Swimlane has not been found.");
20      var filter = Builders<Board>.Filter.Eq(b => b.Id, boardId);
21      if (updatedAt != default)
22          filter &= Builders<Board>.Filter.Eq(b => b.UpdatedAt, updatedAt);
23      var now = DateTime.UtcNow;
24      var update = Builders<Board>.Update
25          .Set("swimlanes.$[sw].tags.$[tg].title", tag.Title)
26          .Set("swimlanes.$[sw].tags.$[tg].color", tag.Color)
27          .Set(b => b.UpdatedAt, now);
28      var arrayFilters = new List<ArrayFilterDefinition>
29      {
30          new BsonDocumentArrayFilterDefinition<BsonDocument>(new BsonDocument("sw._id",
            swimlaneId)),
31          new BsonDocumentArrayFilterDefinition<BsonDocument>(new BsonDocument("tg._id",
            tag.Id))
32      };
33      var updateOptions = new UpdateOptions { ArrayFilters = arrayFilters };
34      var updateResult = await _boardsCollection.UpdateOneAsync(session, filter, update,
        updateOptions, cancellationToken);
35      if (updatedAt != default && updateResult.MatchedCount == 0)
```

```
36          throw new PreconditionFailedException("Board has been modified by another user since
            it was last read.");
37      if (updateResult.MatchedCount != 0 && updateResult.ModifiedCount == 0)
38          throw new InvalidOperationException("An unexpected error occurred while updating tag.
            Board has not been modified.");
39      return now;
40  }
```

5.4.5. Aktualizacja taga wraz z jego zwrotem po zaaktualizowaniu

```
1   public async Task<(Entities.Board.Tag, DateTime)> UpdateAndFindTagAsync(ObjectId boardId,
    ObjectId swimlaneId,                                                                    C#
2       ObjectId userId, Entities.Board.Tag tag, DateTime updatedAt = default, CancellationToken
        cancellationToken = default)
3   {
4       using var session = await _mongoClient.StartSessionAsync(cancellationToken:
        cancellationToken);
5       return await session.WithTransactionAsync(async (s, ctx) =>
6       {
7           var newUpdatedAt = await UpdateTagAsync(boardId, swimlaneId, userId, tag, s,
            updatedAt, ctx);
8           return (await GetTagsBySwimlaneIdAsync(boardId, swimlaneId, s).SingleAsync(t => t.Id
            == tag.Id, ctx), newUpdatedAt);
9       }, cancellationToken: cancellationToken);
10  }
```

5.4.6. Usunięcie taga

```
1   public async Task<DateTime> DeleteTagAsync(ObjectId boardId, ObjectId swimlaneId, ObjectId
    tagId, ObjectId userId,                                                                 C#
2       DateTime updatedAt = default, CancellationToken cancellationToken = default)
3   {
4       using var session = await _mongoClient.StartSessionAsync(cancellationToken:
        cancellationToken);
5       return await session.WithTransactionAsync(async (s, ctx) =>
6       {
7           var result = await _boardsCollection
8               .AsQueryable(s)
9               .Where(x => x.Id == boardId)
10              .Select(x => new
11              {
12                  Tag = x.Swimlanes.Where(s => s.Id == swimlaneId).Select(s =>
                    s.Tags.FirstOrDefault(t => t.Id == tagId)).FirstOrDefault(),
13                  Member = x.Members.FirstOrDefault(m => m.UserId == userId),
14                  x.UpdatedAt
15              })
16              .FirstOrDefaultAsync(ctx)
17              ?? throw new RecordDoesNotExist("Board has not been found.");
18          if (updatedAt != default && updatedAt != result.UpdatedAt)
```

```
19              throw new PreconditionFailedException("Board has been modified by another user
                since it was last read.");
20          if (result.Member?.Role != BoardRole.Owner && result.Member?.Role != BoardRole.Admin)
21              throw new ForbiddenException("User is not authorized to delete this tag.");
22          if (result.Tag == null)
23              throw new RecordDoesNotExist("Tag has not been found.");
24          var filter = Builders<Board>.Filter.Eq(b => b.Id, boardId);
25          var now = DateTime.UtcNow;
26          var update = Builders<Board>.Update.PullFilter(
27              "swimlanes.$[sw].tags",
28              Builders<BsonDocument>.Filter.Eq("_id", tagId))
29              .Set(b => b.UpdatedAt, now);
30          var arrayFilters = new List<ArrayFilterDefinition>
31          {
32              new BsonDocumentArrayFilterDefinition<BsonDocument>(new BsonDocument("sw._id",
                swimlaneId))
33          };
34          var updateOptions = new UpdateOptions { ArrayFilters = arrayFilters };
35          var updateResult = await _boardsCollection.UpdateOneAsync(s, filter, update,
            updateOptions, ctx);
36          if (updatedAt != default && updateResult.MatchedCount == 0)
37              throw new PreconditionFailedException("Board has been modified by another user
                since it was last read.");
38          if (updateResult.MatchedCount != 0 && updateResult.ModifiedCount == 0)
39              throw new InvalidOperationException("An unexpected error occurred while deleting
                tag. Board has not been modified.");
40
41          var cardFilter = Builders<Card>.Filter.AnyEq(c => c.Tags, tagId);
42          var cardUpdate = Builders<Card>.Update.Pull(c => c.Tags, tagId);
43          await _cardsCollection.UpdateManyAsync(s, cardFilter, cardUpdate, cancellationToken:
            ctx);
44          return now;
45      }, cancellationToken: cancellationToken);
46  }
```

5.5. Karty [cards]

5.5.1. Pobranie kart zadanej tablicy

```
1   public async Task<List<CardWithAssignedUserAndTags>> GetCardsByBoardId(ObjectId boardId,
    IClientSessionHandle? session = null,                                                    C#
2       CancellationToken cancellationToken = default)
3   {
4       List<CardWithAssignedUserAndTags> data = await (session == null
5           ? _cardsCollection.AsQueryable()
6           : _cardsCollection.AsQueryable(session))
7           .Where(c => c.BoardId == boardId)
8           .SelectMany(c => c.AssignedUsers.DefaultIfEmpty(), (card, assignedUserId) => new
            { card, assignedUserId })
```

```
9           .GroupJoin(_usersCollection,
10              c => c.assignedUserId,
11              u => u.Id,
12              (x, u) => new { x.card, x.assignedUserId, user = u.FirstOrDefault() })
13          .SelectMany(x => x.card.Tags.DefaultIfEmpty(), (x, tagId) => new { x.card,
            x.assignedUserId, x.user, tagId })
14          .Join(_boardsCollection,
15              x => x.card.BoardId,
16              board => board.Id,
17              (x, board) => new { x.card, x.assignedUserId, x.user, x.tagId, board })
18          .Select(x => new
19          {
20              x.card.Id,
21              x.card.BoardId,
22              x.card.SwimlaneId,
23              x.card.ListId,
24              x.card.Title,
25              x.card.Description,
26              x.card.DueDate,
27              x.card.CreatedAt,
28              x.card.UpdatedAt,
29              Tag = x.board.Swimlanes
30                  .Where(s => s.Id == x.card.SwimlaneId)
31                  .Select(s => s.Tags.FirstOrDefault(t => t.Id == x.tagId))
32                  .FirstOrDefault(),
33              AssignedUser = x.user == null ? null : new SimplifiedUser
34              {
35                  Id = x.user.Id,
36                  Nickname = x.user.Nickname,
37              },
38          })
39          .GroupBy(x => x.Id)
40          .Select(g => new CardWithAssignedUserAndTags
41          {
42              Id = g.Key,
43              BoardId = g.First().BoardId,
44              SwimlaneId = g.First().SwimlaneId,
45              ListId = g.First().ListId,
46              Title = g.First().Title,
47              Description = g.First().Description,
48              DueDate = g.First().DueDate,
49              CreatedAt = g.First().CreatedAt,
50              UpdatedAt = g.First().UpdatedAt,
51              Tags = g.Where(x => x.Tag != null).Select(x => x.Tag!),
52              AssignedUsers = g.Where(x => x.AssignedUser != null).Select(x => x.AssignedUser!),
53          }).ToListAsync(cancellationToken: cancellationToken);
```

```
    var lockedUserIds = LockedCards.Values.Distinct().ToList();
    var lockedUsers = await GetSimplifiedUser(session).Where(u =>
    lockedUserIds.Contains(u.Id)).ToListAsync(cancellationToken);
    var lockedUsersDict = lockedUsers.ToDictionary(u => u.Id, u => u);
    foreach (var card in data)
    {
        if (LockedCards.TryGetValue(card.Id, out var lockedUserId) &&
        lockedUsersDict.TryGetValue(lockedUserId, out var lockedUser))
        {
            card.LockedByUser = new SimplifiedUser
            {
                Id = lockedUser.Id,
                Nickname = lockedUser.Nickname
            };
        }
    }
    return data;
}
```

5.5.2. Pobranie wybranej karty

```C#
public async Task<CardWithAssignedUserAndTags?> GetCardById(ObjectId cardId, ObjectId
boardId,
    IClientSessionHandle? session = null, CancellationToken cancellationToken = default)
{
    CardWithAssignedUserAndTags? data = await (session == null
        ? _cardsCollection.AsQueryable()
        : _cardsCollection.AsQueryable(session))
        .Where(c => c.BoardId == boardId && c.Id == cardId)
        .SelectMany(c => c.AssignedUsers.DefaultIfEmpty(), (card, assignedUserId) => new
        { card, assignedUserId })
        .GroupJoin(_usersCollection,
            c => c.assignedUserId,
            u => u.Id,
            (x, u) => new { x.card, x.assignedUserId, user = u.FirstOrDefault() })
        .SelectMany(x => x.card.Tags.DefaultIfEmpty(), (x, tagId) => new { x.card,
        x.assignedUserId, x.user, tagId })
        .Join(_boardsCollection,
            x => x.card.BoardId,
            board => board.Id,
            (x, board) => new { x.card, x.assignedUserId, x.user, x.tagId, board })
        .Select(x => new
        {
            x.card.Id,
            x.card.BoardId,
            x.card.SwimlaneId,
            x.card.ListId,
            x.card.Title,
```

```
25              x.card.Description,
26              x.card.DueDate,
27              x.card.CreatedAt,
28              x.card.UpdatedAt,
29              Tag = x.board.Swimlanes
30                  .Where(s => s.Id == x.card.SwimlaneId)
31                  .Select(s => s.Tags.FirstOrDefault(t => t.Id == x.tagId))
32                  .FirstOrDefault(),
33              AssignedUser = x.user == null ? null : new SimplifiedUser
34              {
35                  Id = x.user.Id,
36                  Nickname = x.user.Nickname,
37              },
38          })
39          .GroupBy(x => x.Id)
40          .Select(g => new CardWithAssignedUserAndTags
41          {
42              Id = g.Key,
43              BoardId = g.First().BoardId,
44              SwimlaneId = g.First().SwimlaneId,
45              ListId = g.First().ListId,
46              Title = g.First().Title,
47              Description = g.First().Description,
48              DueDate = g.First().DueDate,
49              CreatedAt = g.First().CreatedAt,
50              UpdatedAt = g.First().UpdatedAt,
51              Tags = g.Where(x => x.Tag != null).Select(x => x.Tag!),
52              AssignedUsers = g.Where(x => x.AssignedUser != null).Select(x => x.AssignedUser!),
53          }).FirstOrDefaultAsync(cancellationToken: cancellationToken);
54      if (data == null)
55          return null;
56      if (LockedCards.TryGetValue(data.Id, out var lockedUserId))
57      {
58          var lockedUser = await GetLockingUserById(lockedUserId, session, cancellationToken);
59          if (lockedUser != null)
60          {
61              data.LockedByUser = new SimplifiedUser
62              {
63                  Id = lockedUser.Id,
64                  Nickname = lockedUser.Nickname
65              };
66          }
67      }
68      return data;
69  }
```

5.5.3. Pobranie uproszczonego użytkownika

```C#
private IQueryable<SimplifiedUser> GetSimplifiedUser(IClientSessionHandle? session = null)
{
    return (session == null
        ? _usersCollection.AsQueryable()
        : _usersCollection.AsQueryable(session))
        .Select(x => new SimplifiedUser
        {
            Id = x.Id,
            Nickname = x.Nickname,
        });
}
```

5.5.4. Pobranie użytkownika, który zablokował kartę

```C#
public async Task<SimplifiedUser?> GetLockingUserById(ObjectId id, IClientSessionHandle?
session = null, CancellationToken cancellationToken = default)
{
    return await GetSimplifiedUser(session).FirstOrDefaultAsync(u => u.Id == id,
    cancellationToken);
}
```

5.5.5. Utworzenie nowej karty

```C#
public async Task CreateCardAsync(Card card, ObjectId userId, IClientSessionHandle
session, CancellationToken cancellationToken = default)
{
    var result = await _boardsCollection
        .AsQueryable(session)
        .Where(b => b.Id == card.BoardId)
        .Select(b => new
        {
            b.Members,
            List = b.Swimlanes.Where(s => s.Id == card.SwimlaneId).Select(s =>
            s.Lists.FirstOrDefault(l => l.Id == card.ListId)).FirstOrDefault(),
        })
        .FirstOrDefaultAsync(cancellationToken)
        ?? throw new RecordDoesNotExist("Board has not been found.");
    Member? member = result.Members.FirstOrDefault(x => x.UserId == userId);
    if (member?.Role == BoardRole.Viewer)
        throw new ForbiddenException("User does not have permission to create card.");
    if (card.AssignedUsers.Any(x => !result.Members.Any(m => m.UserId == x)))
        throw new ForbiddenException("One or more assigned users are not members of this
        board.");
    if (result.List == null)
        throw new RecordDoesNotExist("List has not been found.");
    if (result.List.MaxWIP.HasValue && result.List.MaxWIP.Value > 0)
    {
        var filter = Builders<Card>.Filter.Eq(c => c.BoardId, card.BoardId)
```

```
23              & Builders<Card>.Filter.Eq(c => c.SwimlaneId, card.SwimlaneId)
24              & Builders<Card>.Filter.Eq(c => c.ListId, card.ListId);
25          long currentWIP = await _cardsCollection.CountDocumentsAsync(session, filter,
            cancellationToken: cancellationToken);
26          if (currentWIP >= result.List.MaxWIP.Value)
27              throw new ForbiddenException("Maximum cards WIP limit reached for this list.");
28      }
29      card.CreatedAt = DateTime.UtcNow;
30      card.UpdatedAt = DateTime.UtcNow;
31      await _cardsCollection.InsertOneAsync(session, card, cancellationToken:
        cancellationToken);
32  }
```

5.5.6. Utworzenie nowej karty wraz z jej zwrotem po utworzeniu

```C#
1  public async Task<CardWithAssignedUserAndTags> CreateAndFindCardAsync(Card card, ObjectId
   userId, CancellationToken cancellationToken = default)
2  {
3      using var session = await _mongoClient.StartSessionAsync(cancellationToken:
       cancellationToken);
4      return await session.WithTransactionAsync(async (s, ct) =>
5      {
6          await CreateCardAsync(card, userId, s, ct);
7          return await GetCardById(card.Id, card.BoardId, s, ct) ?? throw new
           InvalidOperationException("Card cannot just disappear!!!");
8      }, cancellationToken: cancellationToken);
9  }
```

5.5.7. Aktualizacja karty

```C#
1  public async Task UpdateCardAsync(Card card, ObjectId userId, IClientSessionHandle
   session , CancellationToken cancellationToken = default)
2  {
3      if (LockedCards.TryGetValue(card.Id, out var lockedUserId) && lockedUserId != userId)
4          throw new ForbiddenException("Card is locked by another user. Please try again
           later.");
5      var result = await _boardsCollection
6          .AsQueryable(session)
7          .Where(b => b.Id == card.BoardId)
8          .Select(b => new
9          {
10             b.Members,
11             MaxWIP = b.Swimlanes
12                 .Where(s => s.Id == card.SwimlaneId)
13                 .Select(s => s.Lists
14                     .Where(l => l.Id == card.ListId)
15                     .Select(l => l.MaxWIP)
16                     .FirstOrDefault())
17                 .FirstOrDefault()
```

```
18          })
19          .FirstOrDefaultAsync(cancellationToken)
20          ?? throw new RecordDoesNotExist("Board has not been found.");
21      BoardRole role = result.Members.FirstOrDefault(x => x.UserId == userId)?.Role
22          ?? throw new ForbiddenException("User is not a member of this board.");
23      if (role == BoardRole.Viewer)
24          throw new ForbiddenException("User does not have permission to create card.");
25      if (card.AssignedUsers.Any(x => !result.Members.Any(m => m.UserId == x)))
26          throw new ForbiddenException("One or more assigned users are not members of this
            board.");
27      var oldCard = await _cardsCollection
28          .AsQueryable(session)
29          .Where(x => x.Id == card.Id)
30          .Select(x => new { x.ListId, x.UpdatedAt })
31          .FirstOrDefaultAsync(cancellationToken);
32      if (result.MaxWIP.HasValue && result.MaxWIP.Value > 0)
33      {
34          var countFilter = Builders<Card>.Filter.Eq(c => c.BoardId, card.BoardId)
35              & Builders<Card>.Filter.Eq(c => c.SwimlaneId, card.SwimlaneId)
36              & Builders<Card>.Filter.Eq(c => c.ListId, card.ListId);
37          long currentWIP = await _cardsCollection.CountDocumentsAsync(session, countFilter,
            cancellationToken: cancellationToken);
38          if (oldCard.ListId != card.ListId && currentWIP >= result.MaxWIP.Value)
39              throw new ForbiddenException("Maximum WIP limit reached for this list.");
40      }
41
42      if (card.UpdatedAt != default && oldCard.UpdatedAt != card.UpdatedAt)
43          throw new PreconditionFailedException("Card has been modified or deleted by another
            user since it was last read.");
44      var now = DateTime.UtcNow;
45      var update = Builders<Card>.Update
46          .Set(c => c.Title, card.Title)
47          .Set(c => c.Description, card.Description)
48          .Set(c => c.DueDate, card.DueDate)
49          .Set(c => c.Tags, card.Tags)
50          .Set(c => c.AssignedUsers, card.AssignedUsers)
51          .Set(c => c.UpdatedAt, now);
52      var filter = Builders<Card>.Filter.Eq(c => c.Id, card.Id);
53      if (card.UpdatedAt != default)
54          filter &= Builders<Card>.Filter.Eq(c => c.UpdatedAt, card.UpdatedAt);
55      UpdateResult updateResult = await _cardsCollection.UpdateOneAsync(session, filter, update,
        cancellationToken: cancellationToken);
56      if (updateResult.MatchedCount == 0 && card.UpdatedAt != default)
57          throw new PreconditionFailedException("Card has been modified or deleted by another
            user by another user since it was last read.");
58      else if (updateResult.MatchedCount != 0 && updateResult.ModifiedCount == 0)
```

```
59              throw new InvalidOperationException("An unexpected error occurred while updating card.
                Card has not been modified.");
60          card.UpdatedAt = now;
61          UnlockCard(card.Id, userId);
62      }
```

5.5.8. Aktualizacja karty wraz z jej zwrotem po zaaktualizowaniu

```
1   public async Task<CardWithAssignedUserAndTags> UpdateAndFindCardAsync(Card card, ObjectId
    userId, CancellationToken cancellationToken = default)                                    C#
2   {
3       using var session = await _mongoClient.StartSessionAsync(cancellationToken:
        cancellationToken);
4       return await session.WithTransactionAsync(async (s, ct) =>
5       {
6           await UpdateCardAsync(card, userId, s, ct);
7           return await GetCardById(card.Id, card.BoardId, s, ct) ?? throw new
            InvalidOperationException("Card cannot just disappear!!!");
8       }, cancellationToken: cancellationToken);
9   }
```

5.5.9. Przeniesienie karty do innej listy

```
1   public async Task<DateTime> MoveCardAsync(ObjectId cardId, ObjectId userId, ObjectId
    listId,                                                                                   C#
2       DateTime updatedAt = default, CancellationToken cancellationToken = default)
3   {
4       using var session = await _mongoClient.StartSessionAsync(cancellationToken:
        cancellationToken);
5       return await session.WithTransactionAsync(async (s, ctx) =>
6       {
7           var result = await _cardsCollection
8               .AsQueryable()
9               .Where(card => card.Id == cardId)
10              .Join(
11                  _boardsCollection,
12                  c => c.BoardId,
13                  b => b.Id,
14                  (c, b) => new
15                  {
16                      c.UpdatedAt,
17                      CardAssignedUsers = c.AssignedUsers,
18                      BoardMembers = b.Members,
19                      BoardId = b.Id,
20                      MaxWIP = b.Swimlanes
21                          .Where(s => s.Id == c.SwimlaneId)
22                          .Select(s => s.Lists
23                              .Where(l => l.Id == listId)
24                              .Select(l => l.MaxWIP)
```

```
25                              .FirstOrDefault())
26                          .FirstOrDefault()
27                  }
28              )
29              .FirstOrDefaultAsync(cancellationToken)
30              ?? throw new RecordDoesNotExist("Card has not been found");
31          if (updatedAt != default && updatedAt != result.UpdatedAt)
32              throw new PreconditionFailedException("Board has been modified by another user
                since it was last read.");
33          var member = result.BoardMembers.FirstOrDefault(m => m.UserId == userId)
34              ?? throw new ForbiddenException("User is not a member of this board.");
35          if (member.Role == BoardRole.Viewer && !result.CardAssignedUsers.Contains(userId))
36              throw new ForbiddenException("User does not have permission to move this card");
37          if (result.MaxWIP.HasValue && result.MaxWIP.Value > 0)
38          {
39              long currentWIP = await _cardsCollection.CountDocumentsAsync(x => x.BoardId ==
                result.BoardId
40                  && x.ListId == listId, cancellationToken: cancellationToken);
41              var oldListId = await _cardsCollection
42                  .AsQueryable()
43                  .Where(x => x.Id == cardId)
44                  .Select(x => x.ListId)
45                  .FirstOrDefaultAsync(cancellationToken);
46              if (oldListId != listId && currentWIP >= result.MaxWIP.Value)
47                  throw new ForbiddenException("Maximum WIP limit reached for this list.");
48          }
49          var filter = Builders<Card>.Filter.Eq(c => c.Id, cardId);
50          if (updatedAt != default)
51              filter &= Builders<Card>.Filter.Eq(c => c.UpdatedAt, updatedAt);
52          var now = DateTime.UtcNow;
53          var update = Builders<Card>.Update
54              .Set(c => c.ListId, listId)
55              .Set(c => c.UpdatedAt, now);
56          UpdateResult updateResult = await _cardsCollection.UpdateOneAsync(filter, update,
            cancellationToken: cancellationToken);
57          if (updateResult.MatchedCount == 0 && updatedAt != default)
58              throw new PreconditionFailedException("Card has been modified by another user
                since it was last read.");
59          else if (updateResult.MatchedCount != 0 && updateResult.ModifiedCount == 0)
60              throw new InvalidOperationException("An unexpected error occurred while moving
                card. Card has not been modified.");
61          return now;
62      }, cancellationToken: cancellationToken);
63  }
```

5.5.10. Usunięcie karty

```C#
public async Task DeleteCardAsync(ObjectId cardId, ObjectId userId, DateTime updatedAt = default, CancellationToken cancellationToken = default)
{
    if (LockedCards.TryGetValue(cardId, out var lockedUserId) && lockedUserId != userId)
        throw new ForbiddenException("Card is locked by another user. Please try again later.");
    using var session = await _mongoClient.StartSessionAsync(cancellationToken: cancellationToken);
    await session.WithTransactionAsync(async (s, ctx) =>
    {
        var result = await _cardsCollection
        .AsQueryable(s)
        .Where(card => card.Id == cardId)
        .Join(
            _boardsCollection,
            c => c.BoardId,
            b => b.Id,
            (c, b) => new
            {
                c.UpdatedAt,
                CardId = c.Id,
                BoardRole = b.Members
                    .Where(x => x.UserId == userId)
                    .Select(x => x.Role)
                    .FirstOrDefault(),
            }
        )
        .FirstOrDefaultAsync(ctx);
        if (result == null || result.CardId == default)
            throw new RecordDoesNotExist("Card has not been found.");
        if (updatedAt != default && updatedAt != result.UpdatedAt)
            throw new PreconditionFailedException("Card has been modified or deleted by another user since it was last read.");
        if (result.BoardRole == BoardRole.Viewer)
            throw new ForbiddenException("User does not have permission to delete card.");
        var filter = Builders<Card>.Filter.Eq(c => c.Id, cardId);
        if (updatedAt != default)
            filter &= Builders<Card>.Filter.Eq(c => c.UpdatedAt, updatedAt);
        DeleteResult deleteResult = await _cardsCollection.DeleteOneAsync(s, filter, null, cancellationToken: ctx);
        if (deleteResult.DeletedCount == 0 && updatedAt != default)
            throw new PreconditionFailedException("Card has been modified or deleted by another user since it was last read.");
        return Task.CompletedTask;
    }, cancellationToken: cancellationToken);
    UnlockCard(cardId, userId);
```

```
41 }
```

5.6. Tokeny odświeżenia [refreshTokens]

5.6.1. Dodanie tokena odświeżenia

```C#
public async Task AddRefreshToken(RefreshToken token, CancellationToken cancellationToken = default)
{
    try
    {
        await _refreshTokensCollection.InsertOneAsync(token, null, cancellationToken);
    }
    catch (MongoWriteException ex) when (ex.WriteError.Category == ServerErrorCategory.DuplicateKey)
    {
        throw new RecordAlreadyExists("Duplicate of refresh tokens occured!");
    }
    catch (Exception ex)
    {
        _logger.LogError(ex, "An unexpected error occurred while adding refresh token.");
        throw new InvalidOperationException("An unexpected error occurred while adding refresh token.", ex);
    }
}
```

5.6.2. Usunięcie wszystkich tokenów odświeżenia

```C#
public async Task DeleteAllRefreshTokens(ObjectId userId, CancellationToken cancellationToken = default)
{
    try
    {
        var deleteFilter = Builders<RefreshToken>.Filter.And(
            Builders<RefreshToken>.Filter.Eq(rt => rt.UserId, userId)
        );

        await _refreshTokensCollection.DeleteManyAsync(deleteFilter, cancellationToken);
    }
    catch (Exception ex)
    {
        _logger.LogError(ex, "An unexpected error occurred while deleting refresh tokens.");
        throw new InvalidOperationException("An unexpected error occurred while deleting refresh tokens.", ex);
    }
}
```

5.6.3. Pobranie użytkownika na podstawie tokena odświeżenia

```C#
public async Task<User?> GetUserByRefreshTokenAsync(string refreshToken, CancellationToken cancellationToken = default)
```

```
2   {
3       try
4       {
5           var tokenFilter = Builders<RefreshToken>.Filter.And(
6               Builders<RefreshToken>.Filter.Eq(rt => rt.Token, refreshToken),
7               Builders<RefreshToken>.Filter.Gt(rt => rt.ExpiresAt, DateTime.UtcNow)
8           );
9
10          RefreshToken? token = await
            _refreshTokensCollection.FindOneAndDeleteAsync(tokenFilter, cancellationToken:
            cancellationToken);
11
12          if (token == null)
13              return null;
14
15          return await _userService.GetUserByIdAsync(token.UserId, cancellationToken);
16      }
17      catch (Exception ex)
18      {
19          _logger.LogError(ex, "An unexpected error occurred while getting user by refresh
            token.");
20          throw new InvalidOperationException("An unexpected error occurred while getting user
            by refresh tokenn.", ex);
21      }
22  }
```

5.7. Użytkownicy [users]

5.7.1. Dodanie nowego użytkownika

```C#
1   public async Task AddUserAsync(User user, CancellationToken cancellationToken = default)
2   {
3       try
4       {
5           user.Password = _passwordHasher.HashPassword(user, user.Password);
6           await _usersCollection.InsertOneAsync(user, cancellationToken: cancellationToken);
7       }
8       catch (MongoWriteException ex) when (ex.WriteError.Category ==
        ServerErrorCategory.DuplicateKey)
9       {
10          throw new RecordAlreadyExists("User with such nickname exists!");
11      }
12  }
```

5.7.2. Aktualizacja hasła użytkownika

```C#
1   public async Task UpdatePasswordAsync(User user, CancellationToken cancellationToken =
    default)
2   {
3       user.Password = _passwordHasher.HashPassword(user, user.Password);
```

```
4       user.UpdatedAt = DateTime.UtcNow;
5       var filter = Builders<User>.Filter.Eq(u => u.Id, user.Id);
6       var update = Builders<User>.Update
7           .Set(u => u.Password, user.Password)
8           .Set(u => u.UpdatedAt, user.UpdatedAt);
9       UpdateResult result = await _usersCollection.UpdateOneAsync(filter, update,
        cancellationToken: cancellationToken);
10      if (result.ModifiedCount == 0)
11          throw new RecordDoesNotExist("User has not been found.");
12  }
```

5.7.3. Znalezienie użytkownika po dokładnej nazwie

```
1   public async Task<User?> GetUserByNicknameAsync(string nickname, CancellationToken
    cancellationToken = default)                                                    C#
2   {
3       return await _usersCollection.Find(u => u.Nickname == nickname,
        null).FirstOrDefaultAsync(cancellationToken);
4   }
```

5.7.4. Znalezienie wszystkich użytkowników

```
1   public async Task<List<User>> FindUsersAsync(string? nickname, List<ObjectId>
    blacklistIds, CancellationToken cancellationToken = default)                    C#
2   {
3       var nicknameFilter = string.IsNullOrWhiteSpace(nickname)
4           ? Builders<User>.Filter.Empty
5           : Builders<User>.Filter.Regex(u => u.Nickname, new
            BsonRegularExpression($".*{Regex.Escape(nickname)}.*", "i"));
6
7       var blacklistFilter = (blacklistIds != null && blacklistIds.Count > 0)
8           ? Builders<User>.Filter.Nin(u => u.Id, blacklistIds)
9           : Builders<User>.Filter.Empty;
10
11      var combinedFilter = Builders<User>.Filter.And(nicknameFilter, blacklistFilter);
12
13      return await
        _usersCollection.Find(combinedFilter).Limit(10).ToListAsync(cancellationToken);
14  }
```

5.7.5. Porównanie hashy haseł

```
1   public async Task<bool> VerifyHashedPassword(User user, string providedPassword,
    CancellationToken cancellationToken = default)                                  C#
2   {
3       var result = _passwordHasher.VerifyHashedPassword(user, user.Password, providedPassword);
4       if (result == PasswordVerificationResult.SuccessRehashNeeded)
5       {
6           await _usersCollection.UpdateOneAsync(
7               u => u.Id == user.Id,
```

```
8               Builders<User>.Update
9                   .Set(u => u.Password, _passwordHasher.HashPassword(user, providedPassword))
10                  .Set(u => u.UpdatedAt, DateTime.UtcNow),
11              null,
12              cancellationToken
13          );
14      }
15      return result != PasswordVerificationResult.Failed;
16  }
```

6. Schemat API REST

6.1. POST `/auth/signin`

Treść zapytania:

- Content-Type: `application/json`

```
{
  nickname: string
  password: string
}
```

Odpowiedzi:

- 200 OK

```
{
  accessToken: string
  accessTokenExpiresIn: integer (uint32)
  refreshToken: string
  refreshTokenExpiresIn: integer (uint32)
}
```

- 400 Bad Request
- 401 Unauthorized
- 500 Internal Server Error

6.2. POST `/auth/signup`

Treść zapytania:

- Content-Type: `application/json`

```
{
  nickname: string
  password: string
}
```

Odpowiedzi:

- 200 OK

```
{
  accessToken: string
  accessTokenExpiresIn: integer (uint32)
  refreshToken: string
  refreshTokenExpiresIn: integer (uint32)
}
```

- 400 Bad Request
- 401 Unauthorized
- 500 Internal Server Error

6.3. POST `/auth/refresh`

Treść zapytania:

- Content-Type: `application/json`

```
{
  refreshToken: string
}
```

Odpowiedzi:
- 200 OK

```
{
  accessToken: string
  accessTokenExpiresIn: integer (uint32)
  refreshToken: string
  refreshTokenExpiresIn: integer (uint32)
}
```

- 400 Bad Request
- 401 Unauthorized
- 500 Internal Server Error

6.4. POST `/auth/revoke`

Odpowiedzi:
- 200 OK

```
{
  message: string
}
```

- 401 Unauthorized
- 500 Internal Server Error

6.5. GET `/boards`

Odpowiedzi:
- 200 OK

```
[
  {
    id: string (objectid)
    title: string
    members: [
      {
        userId: string (objectid)
        nickname: string
        role: string
        isActive: boolean
      }
      ...
    ]
    createdAt: string (date-time)
    updatedAt: string (date-time)
  }
  ...
```

```
18 ]
```

- 401 Unauthorized
- 500 Internal Server Error

6.6. POST `/boards`

Treść zapytania:

- Content-Type: `application/json`

```
1  {
2    title: string
3    members: [
4      {
5        userId: string (objectid)
6        role: string
7      }
8      ...
9    ]
10   swimlanes: [
11     {
12       title: string
13       tags: [
14         {
15           title: string
16           color: string
17         }
18         ...
19       ]
20       lists: [
21         {
22           title: string
23           color: string
24           maxWIP: integer (int32)
25         }
26         ...
27       ]
28       color: string
29     }
30     ...
31   ]
32 }
```

Odpowiedzi:

- 200 OK

```
1 {
2   id: string (objectid)
3 }
```

- 400 Bad Request
- 401 Unauthorized
- 500 Internal Server Error

6.7. GET `/boards/{boardId}`

Odpowiedzi:

- 200 OK

```
{
  id: string (objectid)
  title: string
  swimlanes: [
    {
      id: string (objectid)
      title: string
      lists: [
        {
          id: string (objectid)
          title: string
          color: string
          maxWIP: integer (int32)
        }
        ...
      ]
      tags: [
        {
          id: string
          title: string
          color: integer
        }
        ...
      ]
      color: string
    }
    ...
  ]
  members: [
    {
      userId: string (objectid)
      nickname: string
      role: string
      isActive: boolean
    }
    ...
  ]
  createdAt: string (date-time)
  updatedAt: string (date-time)
```

```
40 }
```

- 400 Bad Request
- 401 Unauthorized
- 403 Forbidden
- 404 Not Found
- 500 Internal Server Error

6.8. PATCH `/boards/{boardId}`

Treść zapytania:

- Content-Type: `application/json`

```
1  {
2    title: string
3    members: [
4      {
5          userId: string (objectid)
6          role: string
7      }
8      ...
9    ]
10 }
```

Odpowiedzi:

- 200 OK

```
1 {
2   message: string
3 }
```

- 400 Bad Request
- 401 Unauthorized
- 403 Forbidden
- 404 Not Found
- 409 Conflict
- 500 Internal Server Error

6.9. DELETE `/boards/{boardId}`

Odpowiedzi:

- 200 OK

```
1 {
2   message: string
3 }
```

- 400 Bad Request
- 401 Unauthorized
- 403 Forbidden
- 404 Not Found
- 409 Conflict
- 500 Internal Server Error

6.10. GET `/boards/{boardId}/cards`

Odpowiedzi:

- 200 OK

```
[
  {
    id: string (objectid)
    boardId: string (objectid)
    swimlaneId: string (objectid)
    listId: string (objectid)
    title: string
    description: string
    dueDate: string (date-time)
    assignedUsers: [
      {
        id: string (objectid)
        nickname: string
      }
      ...
    ]
    lockedByUser: {
        id: string (objectid)
        nickname: string
    }
    tags: [
      {
        id: string
        title: string
        color: integer
      }
      ...
    ]
    createdAt: string (date-time)
    updatedAt: string (date-time)
  }
  ...
]
```

- 400 Bad Request
- 401 Unauthorized
- 403 Forbidden
- 404 Not Found
- 500 Internal Server Error

6.11. POST `/boards/{boardId}/cards`

Treść zapytania:

- Content-Type: `application/json`

```
{
  title: string
  swimlaneId: string (objectid)
  listId: string (objectid)
  tags: [
    string (objectid)
    ...
  ]
  dueDate: string (date-time)
  assignedUsers: [
    string (objectid)
    ...
  ]
  description: string
}
```

Odpowiedzi:
- 200 OK

```
{
  id: string (objectid)
}
```

- 400 Bad Request
- 401 Unauthorized
- 403 Forbidden
- 404 Not Found
- 500 Internal Server Error

6.12. GET `/boards/{boardId}/cards/{cardId}`

Odpowiedzi:
- 200 OK

```
{
  id: string (objectid)
  boardId: string (objectid)
  swimlaneId: string (objectid)
  listId: string (objectid)
  title: string
  description: string
  dueDate: string (date-time)
  assignedUsers: [
    {
      id: string (objectid)
      nickname: string
    }
    ...
  ]
```

```
  lockedByUser: {
    id: string (objectid)
    nickname: string
  }
  tags: [
    {
      id: string
      title: string
      color: integer
    }
    ...
  ]
  createdAt: string (date-time)
  updatedAt: string (date-time)
}
```

- 400 Bad Request
- 401 Unauthorized
- 403 Forbidden
- 404 Not Found
- 500 Internal Server Error

6.13. PATCH `/boards/{boardId}/cards/{cardId}`

Treść zapytania:

- Content-Type: `application/json`

```
{
  title: string
  tags: [
    string (objectid)
    ...
  ]
  dueDate: string (date-time)
  assignedUsers: [
    string (objectid)
    ...
  ]
  description: string
}
```

Odpowiedzi:

- 200 OK

```
{
  message: string
}
```

- 400 Bad Request
- 401 Unauthorized

- 403 Forbidden
- 404 Not Found
- 500 Internal Server Error

6.14. DELETE `/boards/{boardId}/cards/{cardId}`

Odpowiedzi:

- 200 OK

```
1 {
2   message: string
3 }
```

- 400 Bad Request
- 401 Unauthorized
- 403 Forbidden
- 404 Not Found
- 500 Internal Server Error

6.15. PATCH `/boards/{boardId}/cards/{cardId}/move`

Treść zapytania:

- Content-Type: `application/json`

```
1 {
2   listId: string (objectid)
3 }
```

Odpowiedzi:

- 200 OK

```
1 {
2   message: string
3 }
```

- 400 Bad Request
- 401 Unauthorized
- 403 Forbidden
- 404 Not Found
- 500 Internal Server Error

6.16. GET `/boards/{boardId}/swimlanes/{swimlaneId}/lists`

Odpowiedzi:

- 200 OK

```
1 [
2   {
3     id: string (objectid)
4     title: string
5     color: string
6     maxWIP: integer (int32)
7   }
8   ...
```

```
9 ]
```

- 400 Bad Request
- 401 Unauthorized
- 404 Not Found
- 500 Internal Server Error

6.17. POST `/boards/{boardId}/swimlanes/{swimlaneId}/lists`

Treść zapytania:

- Content-Type: `application/json`

```
1 {
2   title: string
3   color: string
4   maxWIP: integer (int32)
5 }
```

Odpowiedzi:

- 200 OK

```
1 {
2   id: string (objectid)
3 }
```

- 400 Bad Request
- 401 Unauthorized
- 404 Not Found
- 500 Internal Server Error

6.18. GET `/boards/{boardId}/swimlanes/{swimlaneId}/lists/{listId}`

Odpowiedzi:

- 200 OK

```
1 {
2   id: string (objectid)
3   title: string
4   color: string
5   maxWIP: integer (int32)
6 }
```

- 400 Bad Request
- 401 Unauthorized
- 404 Not Found
- 500 Internal Server Error

6.19. PATCH `/boards/{boardId}/swimlanes/{swimlaneId}/lists/{listId}`

Treść zapytania:

- Content-Type: `application/json`

```
1 {
2   title: string
```

```
3    color: string
4    maxWIP: integer (int32)
5  }
```

Odpowiedzi:
- 200 OK

```
1  {
2    message: string
3  }
```

- 400 Bad Request
- 401 Unauthorized
- 404 Not Found
- 500 Internal Server Error

6.20. DELETE `/boards/{boardId}/swimlanes/{swimlaneId}/lists/{listId}`

Odpowiedzi:
- 200 OK

```
1  {
2    message: string
3  }
```

- 400 Bad Request
- 401 Unauthorized
- 404 Not Found
- 500 Internal Server Error

6.21. GET `/boards/{boardId}/swimlanes`

Odpowiedzi:
- 200 OK

```
1  [
2    {
3      id: string (objectid)
4      title: string
5      color: string
6    }
7    ...
8  ]
```

- 400 Bad Request
- 401 Unauthorized
- 403 Forbidden
- 404 Not Found
- 500 Internal Server Error

6.22. POST `/boards/{boardId}/swimlanes`

Treść zapytania:
- Content-Type: `application/json`

```
{
  title: string
  tags: [
    {
      title: string
      color: string
    }
    ...
  ]
  lists: [
    {
      title: string
      color: string
      maxWIP: integer (int32)
    }
    ...
  ]
  color: string
}
```

Odpowiedzi:
- 200 OK

```
{
  id: string (objectid)
}
```

- 400 Bad Request
- 401 Unauthorized
- 403 Forbidden
- 404 Not Found
- 500 Internal Server Error

6.23. GET `/boards/{boardId}/swimlanes/{swimlaneId}`

Odpowiedzi:
- 200 OK

```
{
  id: string (objectid)
  title: string
  lists: [
    {
      id: string (objectid)
      title: string
      color: string
      maxWIP: integer (int32)
    }
    ...
```

```
12    ]
13    tags: [
14      {
15        id: string
16        title: string
17        color: integer
18      }
19      ...
20    ]
21    color: string
22  }
```

- 400 Bad Request
- 401 Unauthorized
- 403 Forbidden
- 404 Not Found
- 500 Internal Server Error

6.24. PATCH `/boards/{boardId}/swimlanes/{swimlaneId}`

Treść zapytania:

- Content-Type: `application/json`

```
1  {
2    title: string
3    color: string
4  }
```

Odpowiedzi:

- 200 OK

```
1  {
2    message: string
3  }
```

- 400 Bad Request
- 401 Unauthorized
- 403 Forbidden
- 404 Not Found
- 500 Internal Server Error

6.25. DELETE `/boards/{boardId}/swimlanes/{swimlaneId}`

Odpowiedzi:

- 200 OK

```
1  {
2    message: string
3  }
```

- 400 Bad Request
- 401 Unauthorized
- 403 Forbidden

- 404 Not Found
- 500 Internal Server Error

6.26. GET `/boards/{boardId}/swimlanes/{swimlaneId}/tags`

Odpowiedzi:

- 200 OK

```
[
  {
    id: string
    title: string
    color: integer
  }
  ...
]
```

- 400 Bad Request
- 401 Unauthorized
- 403 Forbidden
- 404 Not Found
- 500 Internal Server Error

6.27. POST `/boards/{boardId}/swimlanes/{swimlaneId}/tags`

Treść zapytania:

- Content-Type: `application/json`

```
{
  title: string
  color: string
}
```

Odpowiedzi:

- 200 OK

```
{
  id: string (objectid)
}
```

- 400 Bad Request
- 401 Unauthorized
- 403 Forbidden
- 404 Not Found
- 500 Internal Server Error

6.28. GET `/boards/{boardId}/swimlanes/{swimlaneId}/tags/{tagId}`

Odpowiedzi:

- 200 OK

```
{
  id: string
  title: string
```

```
4    color: integer
5  }
```

- 400 Bad Request
- 401 Unauthorized
- 403 Forbidden
- 404 Not Found
- 500 Internal Server Error

6.29. PATCH `/boards/{boardId}/swimlanes/{swimlaneId}/tags/{tagId}`

Treść zapytania:

- Content-Type: `application/json`

```
1  {
2    title: string
3    color: string
4  }
```

Odpowiedzi:

- 200 OK

```
1  {
2    message: string
3  }
```

- 400 Bad Request
- 401 Unauthorized
- 403 Forbidden
- 404 Not Found
- 500 Internal Server Error

6.30. DELETE `/boards/{boardId}/swimlanes/{swimlaneId}/tags/{tagId}`

Odpowiedzi:

- 200 OK

```
1  {
2    message: string
3  }
```

- 400 Bad Request
- 401 Unauthorized
- 403 Forbidden
- 404 Not Found
- 500 Internal Server Error

6.31. GET `/users/me`

Odpowiedzi:

- 200 OK

```
1  {
2    id: string (objectid)
```

```
3    nickname: string
4    createdAt: string (date-time)
5    updatedAt: string (date-time)
6  }
```

- 401 Unauthorized
- 500 Internal Server Error

6.32. PATCH `/users/me`

Treść zapytania:

- Content-Type: `application/json`

```
1  {
2    password: string
3  }
```

Odpowiedzi:

- 200 OK

```
1  {
2    message: string
3  }
```

- 400 Bad Request
- 401 Unauthorized
- 404 Not Found
- 500 Internal Server Error

6.33. GET `/users`

Odpowiedzi:

- 200 OK

```
1  [
2    {
3      id: string (objectid)
4      nickname: string
5      createdAt: string (date-time)
6      updatedAt: string (date-time)
7    }
8    ...
9  ]
```

- 401 Unauthorized
- 500 Internal Server Error

6.34. GET `/users/{userId}`

Odpowiedzi:

- 200 OK

```
1  {
2    id: string (objectid)
```

```
3    nickname: string
4    createdAt: string (date-time)
5    updatedAt: string (date-time)
6  }
```

- 400 Bad Request
- 401 Unauthorized
- 404 Not Found
- 500 Internal Server Error