LINQ to SQL vs **Entity Framework**

LINQ to SQL vs **Entity Framework** is one of the most important distinctions in older ASP.NET applications.

✅ 1. LINQ to SQL (System.Data.Linq)

Namespace:

```
using System.Data.Linq;
```

✔ What it is:

A lightweight ORM (Object Relational Mapper) from early .NET versions.

✔ How it works:

- You use a .dbml file (LINQ to SQL Designer).
- It maps **one database table = one C# class**.
- Works **only with SQL Server**.

✔ Example:

```
DataClasses1DataContext db = new DataClasses1DataContext();
var result = from e in db.Employees select e;
```

✔ Advantages:

- Simple
- Fast for small projects
- Easy to understand

❌ Limitations:

- **No support** for complex relationships
- **No migrations**
- **No advanced mapping**
- Only supports **SQL Server**
- Microsoft stopped improving it (frozen technology)

✅ 2. Entity Framework (EF 6) (System.Data.Entity)

Namespace:

```
using System.Data.Entity;
```

✔ What it is:

A much more powerful ORM.

✔ How it works:

- Uses .edmx file (database-first)
- Or Code-First with migrations
- Supports **many database types**, not just SQL Server

✔ Example:

```
using (var db = new EmployeesEntities())
{
   var result = db.employees.ToList();
}
```

✔ Advantages:

- Supports **relationships** (1-to-many, many-to-many)
- Supports **migrations**

- Supports **lazy loading**, **change tracking**
- Supports **multiple databases**
- Full LINQ support
- Much more flexible

✗ Disadvantages:

- Slower than LINQ to SQL (usually not a problem)
- More complex

🆚 Side-by-Side Comparison

Feature	**LINQ to SQL**	**Entity Framework**
Namespace	System.Data.Linq	System.Data.Entity
Designer	.dbml	.edmx or Code-First
Database Support	SQL Server only	SQL Server, Oracle, MySQL, SQLite, etc
Complexity	Simple	More powerful
Many-to-many relationships	❌ No	✓ Yes
Stored Procedures	Basic	Full support
Migrations	❌ No	✓ Yes
Performance	Slightly faster	Good enough

🚀 Which one should you use?

✓ For new ASP.NET WebForms or MVC projects → USE Entity Framework

It is modern, supported, and flexible.

✓ LINQ to SQL is only used when:

- A project is very old
- You want something extremely simple
- Only SQL Server is used
- No complex relationships exist

👍 Summary

- **System.Data.Linq → Old technology → LINQ to SQL**
- **System.Data.Entity → Modern → Entity Framework (EF 6)**
- Entity Framework is the recommended ORM for ASP.NET WebForms.