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Let's start developing Blazor applications
with "high performance" tuning!



Self Introduction

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I am solving customers' UI/UX problems with our knowledge and products, especially about web applications every day.

Also known as a "dog lover".

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Infragistics

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</div> We Infragistics provides well designed and high functional UI controls and components for developers over 30 years.

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Questions

1. Have you already developed web application?
2. To Desktop Application developer, Is there any necessity of web app development in near future?
3. To Web developer, which framework do you use? Web Forms, MVC or something?

What's happening in Japan

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Demand of Blazor was much increased 2022

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One of common scenario:

- The developer works for implementing desktop application for the system inside a plant.
- They are facing new request that about monitoring system to see a status of plant operation for managers.
- Since the manager have to move around a lot during the job, they

Today's Topics

- The reason why I recommend you Blazor as the web development framework.
- The points you should take care for web application as performance perspective.
- Let's start to create a new Blazor web application with performance tuning.
- What if more complex functional UI components are needed.

Why you should choice Blazor

- You are C# developer.
- You are familiar with Blazor Server.
- You can create latest SPA web application.
- Document and showcase are incresing day by day.
- Microsoft is paying a lot of attention to Blazor.
- A lot of library vendors were adopted Blazor including Infragistics.

Web application performance

Three dimensions of web app performance

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1. Load Time Performance

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- How fast the web application load.
- For a desktop app, the time to excute application and be able to start interaction for user.
- To measure this performance, I suggest your use the Lighthouse.
- You should check "First Contentful Paint" metrics firstly.



Performance

Values are estimated and may vary. The [performance score is calculated](#) directly from these metrics. [See calculator.](#)

▲ 0–49 ■ 50–89 ● 90–100

METRICS

[Expand view](#)

● First Contentful Paint
1.4 s

● Time to Interactive
3.4 s

● Speed Index
1.7 s

■ Total Blocking Time
270 ms

■ Largest Contentful Paint
3.3 s

● Cumulative Layout Shift
0

To reduce the Load Time

	Tips	Sample Result
Blazor Server	Basically, you don't have to care.	-
Blazor WebAssembly	Use Brotli to compress files.(https://learn.microsoft.com/en-us/aspnet/core/blazor/host-and-deploy/webassembly?view=aspnetcore-7.0#customize-how-boot-resources-are-loaded)	80%
	Turn on IL trimming to reduce the size of published output.(https://learn.microsoft.com/en-us/aspnet/core/blazor/host-and-deploy/configure-trimmer?view=aspnetcore-7.0)	44%
	Installing a	

Three dimensions of web app performance

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2. Run Time Performance

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- How responsive the web app is to user interactions.
- Chrome developer tools is good to identify performance bottlenecks.
- Some guidelines to improve run time performance:
 - Less than 1500 nodes in total. The maximum depth is 32 nodes.
No parent node has more than 60 child nodes.

Three dimensions of web app performance

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3. Soft Performance

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This dimension is not easy to talk, hard to measure, this is related to User Experience for example:

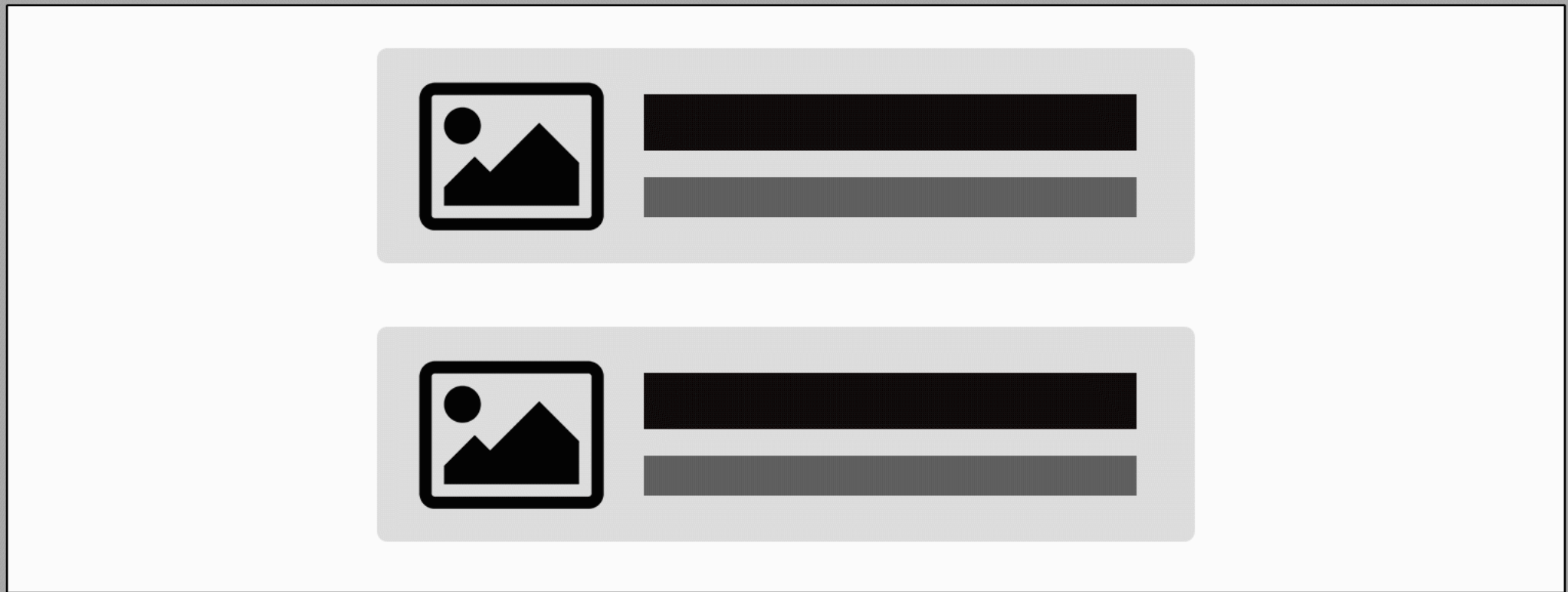
- How easy it is for your user to find and navigate to the feature they want to use.
- How appealing the look and feel of your application is.
- How good the error messages your software produces to

Tips of Web application performance

Component Virtualization

Virtualization is a technique for limiting UI rendering to just the parts that are currently visible.

- You can use this technique for huge amount of looping content, like list, card, table.
- With calculating the position of scroll, just rendering necessary DOM inside a viewable area.
- When rendered DOM go outside from viewable area, it going to be destroyed.
- This is an out-of-the-box function for Blazor.



Let's make virtualized table with 10k items

```
<table>
  ...
  @foreach (var item in Items)
    <tr>
      <td>@item.FirstName</td>
      <td>@item.LastName</td>
      ...
    }
  }
```

```
...
<Virtualize Items="@Items" OverscanCount="10" Context="item">
  <tr>
    <td>@item.FirstName</td>
    <td>@item.LastName</td>
    ...
  </Virtualize>
```

What happens if you don't virtualize?

<small>

With 10k items

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Aw, Snap!

Something went wrong while displaying this webpage.

Error code: Out of Memory

[Learn more](#)

Reload

<small> **With 2.5k items** </small>

Let's look at the result of virtulization

You need more complex functional UI?

To keep both functionality and performance is so difficult

- Feature request that never ends.
 - Sorting, Filtering, To register the short cut and so on.
- The difficulty of performance tuning increase for functional UI controls.
- Too hard to navigate the end user to each feature, easily produce bad user experience.

Takeaway

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- You don't need to hesitate to Blazor now, let's try to start!
- Handle three kind of dimensions for performance!
- If complex UI is require, rely on professional like Infragistics!

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