
Kweb: Pleasant web development, in Kotlin

Ian Clarke

Feb 23, 2020

1	Introduction	3
1.1	Motivation	3
1.2	How does it work?	4
1.3	Features	4
1.4	Relevant Links	4
2	Getting Started	5
2.1	What you'll need	5
2.2	Adding Kweb to your project	5
2.3	Hello world	5
2.4	Hello world ²	6
3	DOM Basics	9
3.1	Creating DOM Elements and Fragments	9
3.2	Reading from the DOM	10
3.3	Supported HTML tags	10
3.4	Extending Kweb to support new HTML tags	11
3.5	Further Reading	11
4	Event Handling	13
4.1	Listening for events	13
4.2	Immediate events	13
4.3	Combination event handlers	14
5	Observer Pattern & State	15
5.1	Overview	15
5.2	Building blocks	15
5.3	KVars and the DOM	16
5.4	Binding a KVar to an input element's value	16
5.5	Rendering state to a DOM fragment	17
5.6	Extracting data class properties	17
5.7	KVals & Reversible mapping	17
6	URL Routing	19
6.1	A simple example	19
6.2	Handling 404s	20
6.3	Modifying the URL	20

7	Database	23
7.1	Overview	23
7.2	Shoebox and State	23
7.3	Other Databases	24
7.4	Working Example	24
8	CSS & Style	25
8.1	Getting started	25
8.2	Other UI Frameworks	26
8.3	Example and Demo	26
9	Frequently Asked Questions	27
9.1	Won't Kweb be slow relative to client-side web frameworks?	27
9.2	What's the difference between Kweb and Vaadin?	27
9.3	Is there a larger working example?	28
9.4	How do I enable HTTPS?	28
9.5	What about templates?	28
9.6	Why risk my project on a framework I just heard of?	28
9.7	How is "Kweb" pronounced?	28
9.8	I can't say "Kweb" to my boss!	28
9.9	Can Kweb be embedded in an existing Ktor app?	28
9.10	I have a question not answered here	29

A new way to create beautiful, efficient, and scalable websites in Kotlin, quickly.

This documentation is a work-in-progress, feedback is very welcome. If you have questions, suggestions, or if you encounter a problem then please [submit a Github issue](#) and we'll get back to you ASAP.

We also welcome contributions via [pull request](#).

1.1 Motivation

Most websites consist of at least two tightly coupled components. One runs in the browser, the other on the server:

- **Browser**
 - Responsible for user interaction
 - Typically written in JavaScript
 - Untrusted execution environment
 - Unreliable persistent local state
- **Server**
 - Runs in a datacenter
 - Responsible for business logic
 - May be written in a wide variety of languages
 - Trusted execution environment
 - Reliable persistent global state

These two tightly coupled components are often written in different languages and must communicate with each other over a HTTP connection. This adds significant complexity to the overall system.

Kweb is designed to solve this problem by departing from the “fat client” architecture. We do this by moving as much of the logic to the server as possible, leaving a simple but powerful interface to the web browser where server-browser communications are handled automatically.

Kweb includes a typesafe [domain-specific language](#) for building and manipulating the [DOM](#) in a remote web browser.

Kweb runs on [Kotlin](#), an excellent modern programming language that is rapidly growing in popularity. Kotlin is now Google’s recommended language for [Android development](#).

According to Github, Kotlin was the [fastest growing](#) programming language of 2018.

1.2 How does it work?

Kweb is a self-contained Kotlin library that can be added easily to new or existing projects. When Kweb receives a HTTP request it responds with a small HTML file including optimized instructions for building the page, and a client which connects back to the web server via a WebSocket. The client then waits and listens for instructions from the server.

To minimize latency, Kweb can [preload](#) instructions to the browser to modify the DOM instantly in response to browser events, perhaps to disable a button or temporarily display a “spinner”. This allows Kweb to respond instantly to user behavior without a server round-trip.

Kweb is designed to be efficient. All operations are handled asynchronously, thread and memory usage are minimized. Kweb runs on the JVM, which is 5-10 times [faster](#) than Node.js.

Kweb also takes an end-to-end approach to state. You can bind the value of a DOM element to a field in your database, and have it update in realtime [automatically](#).

1.3 Features

- Free as in speech, licenced under [LGPL v3.0](#)
- A unified codebase for your webapp, from database to DOM
- End-to-end Kotlin ([Why Kotlin?](#))
- Bind DOM values directly to a value in your database and have them update in realtime
- Statically typed HTML DSL - let your IDE catch bugs so you don't have to
- Efficient server-side rendering, DOM caching, and instruction preloading
- Very lightweight, Kweb is less than 5,000 lines of code

1.4 Relevant Links

- Website: <https://kweb.io/>
- Source code: <https://github.com/kwebio/kweb-core>
- Demo: <http://demo.kweb.io:7659/>
- Questions/Feedback/Bugs: <https://github.com/kwebio/kweb-core/issues>
- API Docs: <https://javadoc.jitpack.io/com/github/kwebio/kweb-core/latest/javadoc/index.html>

2.1 What you'll need

Some familiarity with [Kotlin](#) is assumed, as is familiarity with [Gradle](#). You should also have some familiarity with [HTML](#).

2.2 Adding Kweb to your project

Kweb is distributed via JitPack, so add this to the repositories {block} in your build.gradle:

```
repositories {
    maven { url 'https://jitpack.io' }
    jcenter()
}
```

Then add Kweb to the dependencies block:

```
dependencies {
    compile 'com.github.kwebio:kweb-core:LATEST_VERSION'

    // This (or another SLF4J binding) is required for Kweb to log errors
    compile group: 'org.slf4j', name: 'slf4j-simple', version: '1.7.30'
}
```

Replace LATEST_VERSION with the latest version of Kweb, which you can find on <https://jitpack.io/#kwebio/kweb-core>.

2.3 Hello world

Create a new Kotlin file and type this:

```
import io.kweb.*
import io.kweb.dom.element.*
import io.kweb.dom.element.creation.tags.*

fun main() {
    Kweb(port = 16097) {
        doc.body.new {
            h1().text("Hello World!")
        }
    }
}
```

Run it, and then visit <http://localhost:16097/> in your web browser to see the traditional greeting, translating to the following HTML body:

```
<body>
  <h1>Hello World!</h1>
</body>
```

This simple example already illustrates some important features of Kweb:

- Getting a kwebsite up and running is a breeze, no messing around with servlets, or third party webservers
- Your Kweb code will loosely mirror the structure of the HTML it generates

2.4 Hello world²

One way to think of Kweb is as a [domain-specific language \(DSL\)](#) for building and manipulating a [DOM](#) in a remote web browser, while also listening for and handing DOM events.

Importantly, this DSL can also do anything Kotlin can do, including features like for loops, functions, coroutines, and classes.

Here is a simple example using an ordinary Kotlin *for loop*:

```
import io.kweb.*
import io.kweb.dom.element.*
import io.kweb.dom.element.creation.tags.*

fun main() {
    Kweb(port = 16097) {
        doc.body.new {
            ul().new {
                for (x in 1..5) {
                    li().text("Hello World $x!")
                }
            }
        }
    }
}
```

To produce...

```
<body>
  <ul>
    <li>Hello World 1!</li>
```

(continues on next page)

(continued from previous page)

```
<li>Hello World 2!</li>
<li>Hello World 3!</li>
<li>Hello World 4!</li>
<li>Hello World 5!</li>
</ul>
</body>
```

You can use functions for modularization and reuse:

```
fun main() {
    Kweb(port = 16097) {
        doc.body.new {
            ul().new {
                for (x in 1..5) {
                    createMessage(x)
                }
            }
        }
    }
}

private fun ElementCreator<UElement>.createMessage(x: Int) {
    li().text("Hello World $x!")
}
```

As you can see this is an extension function, which allows you to use the Kweb DSL within the newly created function.

Don't worry if you're unsure about this because you can use IntelliJ's [extract function](#) refactoring to create these functions automatically.

3.1 Creating DOM Elements and Fragments

The DOM is built starting with an `Element`, typically the `BodyElement` which is obtained easily as follows:

```
import io.kweb.*
import io.kweb.dom.element.*

fun main() {
  Kweb(port = 16097) {
    val body : BodyElement = doc.body
  }
}
```

Let's create a `ButtonElement` as a child of the body element, we do this using the `.new` function (which is supported by all `Element` types):

```
import io.kweb.*
import io.kweb.dom.element.*

fun main() {
  Kweb(port = 16097) {
    doc.body.new {
      button().text("Click Me!")
    }
  }
}
```

If you assign the button element to a `val` then you can also modify its attributes:

```
val button = button()
button.text("Click Me!")
button.classes("bigbutton")
button.setAttributeRaw("autofocus", true)
```

Or equivalently using Kotlin's `apply` scope function:

```
button().apply {
    text("Click Me!")
    classes("bigbutton")
    setAttributeRaw("autofocus", true)
}
```

Or delete it:

```
button.delete()
```

3.2 Reading from the DOM

Kweb can also read from the DOM, in this case the value of an `<input>` element:

```
import io.kweb.Kweb
import io.kweb.dom.element.creation.tags.*
import io.kweb.dom.element.events.on
import io.kweb.dom.element.new
import io.kweb.state.KVar
import kotlinx.coroutines.GlobalScope
import kotlinx.coroutines.future.await
import kotlinx.coroutines.launch

fun main() {
    Kweb(port = 2395) {
        doc.body.new {
            val input: InputElement = input()
            input.on.submit {
                GlobalScope.launch {
                    val value = input.getValue().await()
                    println("Value: $value")
                }
            }
        }
    }
}
```

Note that `input.getValue()` returns a `CompletableFuture<String>`. This is because it can take up to several hundred milliseconds to retrieve from the browser, and we don't want the application to block if it can be avoided. Here we use Kotlin's very powerful `coroutines` features to avoid any unnecessary blocking.

Note: We discuss an even better way to read `<input>` values in the [Observer Pattern & State](#) section.

3.3 Supported HTML tags

Kweb supports a significant subset of HTML tags like `button()`, `p()`, `a()`, `table()`, and so on. You can find a more complete list in the [API documentation](#) (scroll down to the *Functions* section). This provides a nice statically-typed HTML DSL, fully integrated with the Kotlin language.

If a tag doesn't have explicit support in Kweb that's not a problem. For example, here is how you might use the infamous and now-obsolete `<blink>` tag:

```
doc.body.new {  
    val blink = element("blink").text("I am annoying!")  
}
```

3.4 Extending Kweb to support new HTML tags

Adding support for new tags to Kweb is easy, take a look at [the source](#). If you add some useful functionality please submit a pull request [via Github](#), or just [ask us](#) and we'll do our best to add support.

3.5 Further Reading

The [Element](#) class provides many other useful ways to interact with DOM elements.

4.1 Listening for events

You can attach event handlers to DOM elements:

```
doc.body.new {
  val label = h1()
  label.text("Click Me")
  label.on.click {
    label.text("Clicked!")
  }
}
```

Most if not all JavaScript event types are supported, and you can read event data like which key was pressed:

```
doc.body.new {
  val input = input(type = text)
  input.on.keypress { keypressEvent ->
    println("Key Pressed: ${keypressEvent.key}")
  }
}
```

4.2 Immediate events

Since the code to respond to events runs on the server, there may be a short lag between the action causing the event and any changes to the DOM caused by the event handler. This was a common complaint about previous server-driven web frameworks like Vaadin, inhibiting their adoption.

Fortunately, Kweb has a solution - `onImmediate`:

```
doc.body.new {
    val label = h1()
    label.text("Click Me")
    label.onImmediate.click {
        label.text("Clicked!")
    }
}
```

This is identical to the first event listener example, except *on* has been replaced by *onImmediate*.

Kweb executes this event handler *on page render* and records the changes it makes to the DOM. It then “pre-loads” these instructions to the browser such that they are executed immediately when the event occurs without any server round-trip.

Warning: Due to this pre-loading mechanism, the event handler for an *onImmediate* must limit itself to simple DOM modifications. Kweb includes some runtime safeguards against this but they can’t catch every problem so please use with caution.

4.3 Combination event handlers

A common pattern is to use both types of event handler on a DOM element. The immediate handler might disable a clicked button, or temporarily display some form of [spinner](#). The normal handler would then do what it needs on the server, and then perhaps re-enable the button and remove the spinner.

5.1 Overview

Kweb uses the [observer pattern](#) to manage state.

A Kweb app can be viewed as a mapping function between state on the server and the DOM within the end-user's web browser. Once this mapping is defined, simply modify this state and the change will propagate automatically to the browser.

5.2 Building blocks

A `KVar` class contains a single typed object, which can change over time. For example:

```
val counter = KVar(0)
```

Here we create a counter of type `KVar<Int>` initialized with the value 0.

We can also read and modify the value of a `KVar`:

```
println("Counter value ${counter.value}")
counter.value = 1
println("Counter value ${counter.value}")
counter.value++
println("Counter value ${counter.value}")
```

Will print:

```
Counter value 0
Counter value 1
Counter value 2
```

`KVars` support powerful mapping semantics to create new `KVars`:

```
val counterDoubled = counter.map { it * 2 }
counter.value = 5
println("counter: ${counter.value}, doubled: ${counterDoubled.value}")
counter.value = 6
println("counter: ${counter.value}, doubled: ${counterDoubled.value}")
```

Will print:

```
counter: 5, doubled: 10
counter: 6, doubled: 12
```

Note that `counterDoubled` updates automatically.

Note: KVars should only be used to store values that are themselves immutable, such as an `Int`, `String`, or a Kotlin `data class` with immutable parameters.

5.3 KVars and the DOM

You can use a `KVar` (or `KVal`) to set the text of a DOM element:

```
val name = KVar("John")
li().text(name)
```

The neat part is that if the value of `name` changes, the DOM element text will update automatically. It may help to think of this as a way of “unwrapping” a `KVar`.

Numerous other functions on `Elements` support `KVars` in a similar manner, including `innerHTML()` and `setAttribute()`.

5.4 Binding a KVar to an input element’s value

For `<input>` elements you can set the value to a `KVar`, which will connect them bidirectionally.

Any changes to the `KVar` will be reflected in realtime in the browser, and similarly any changes in the browser by the user will be reflected immediately in the `KVar`, for example:

```
Kweb(port = 2395) {
    doc.body.new {
        p().text("What is your name?")
        val clickMe = input(type = text)
        val nameKVar = KVar("Peter Pan")
        clickMe.value = nameKVar
        p().text(nameKVar.map { n -> "Hi $n!" })
    }
}
```

This will also work for `<option>` and `<textarea>` elements which also have values.

See also: [ValueElement.value](#)

5.5 Rendering state to a DOM fragment

But what if you want to do more than just modify a single element based on a KVar, what if you want to modify a whole tree of elements?

This is where the `render` function comes in:

```
val list = KVar(listOf("one", "two", "three"))

Kweb(port = 16097) {
    doc.body.new {
        render(list) { rList ->
            ul().new {
                for (item in rList) {
                    li().text(item)
                }
            }
        }
    }
}
```

Here, if we were to change the list:

```
list.value = listOf("four", "five", "six")
```

Then the relevant part of the DOM will be redrawn instantly.

The simplicity of this mechanism may disguise how powerful it is, since `render {}` blocks can be nested, it's possible to be very selective about what parts of the DOM must be modified in response to changes in state.

Note: Kweb will only re-render a DOM fragment if the value of the KVar actually changes so you should avoid “unwrapping” KVars with a `render()` or `.text()` call before you need to.

The `KVal.map {}` function is a powerful tool for manipulating KVals and KVars without unwrapping them.

5.6 Extracting data class properties

If your KVar contains a `data class` then you can use `Kvar.property()` to create a KVar from one of its properties which will update the original KVar if changed:

```
data class User(val name : String)
val user = KVar(User("Ian"))
val name = user.property(User::name)
name.value = "John"
println(user) // Will print: KVar(User(name = "John"))
```

5.7 KVals & Reversible mapping

If you check the type of `counterDoubled`, you'll notice that it's a `KVal` rather than a `KVar`. `KVal`'s values may not be modified directly, so this won't be permitted:

```
counterDoubled.value = 20 // <--- This won't compile
```

The *KVar* class has a second `map()` function which takes a *ReversibleFunction* implementation. This version of `map` will produce a *KVar* which can be modified, as follows:

```
val counterDoubled = counter.map(object : ReversibleFunction<Int, Int>("doubledCounter  
↔") {  
    override fun invoke(from: Int) = from * 2  
    override fun reverse(original: Int, change: Int) = change / 2  
})  
counter.value = 5  
println("counter: ${counter.value}, doubled: ${counterDoubled.value}")  
  
counterDoubled.value = 12 // <--- This wouldn't have worked before  
println("counter: ${counter.value}, doubled: ${counterDoubled.value}")
```

Will print:

```
counter: 5, doubled: 10  
counter: 6, doubled: 12
```

Note: Reversible mappings are an advanced feature that you only need if you want the mapped value to be a mutable *KVar*. Most of the time the simple `KVal.map {}` function will be what you need.

In a web application, routing is the process of using URLs to drive the user interface (UI). URLs are a prominent feature in every web browser, and have several main functions:

- Bookmarking - Users can bookmark URLs in their web browser to save content they want to come back to later.
- Sharing - Users can share content with others by sending a link to a certain page.
- Navigation - URLs are used to drive the web browser's back/forward functions.

Traditionally, visiting a different URL within the same website would cause a new page to be downloaded from the server, but current state-of-the-art websites are able to modify the page in response to URL changes without a full refresh.

With Kweb's routing mechanism you get this automatically.

6.1 A simple example

```
import io.kweb.Kweb
import io.kweb.dom.element.new
import io.kweb.dom.element.creation.tags.h1
import io.kweb.routing.route

fun main() {
    Kweb(port = 16097) {
        doc.body.new {
            route {
                path("/users/{userId}") { params ->
                    val userId = params.getValue("userId")
                    h1().text(userId.map { "User id: $it" })
                }
                path("/lists/{listId}") { params ->
                    val listId = params.getValue("listId")
                    h1().text(listId.map { "List id: $it" })
                }
            }
        }
    }
}
```

(continues on next page)

(continued from previous page)

```
        }
    }
}
}
```

Now, if you visit <http://localhost:16097/users/997>, you will see:

```
<h1>User id: 997</h1>
```

You can have as many `path()`s as you need, each with its own path definition. The definition can contain parameters wrapped in `{braces}`.

The value of these parameters can then be retrieved from the `params` map, but note that the values are wrapped in a `KVar<String>` object. This means that you can use all of Kweb's [state management](#) features to render parts of the DOM using this value.

The key advantage here is that if the URL changes the page can be updated without a full page refresh, but rather only changing the parts of the DOM that need to change - this is much faster and more efficient.

6.2 Handing 404s

You can override the default 404 Page Not Found message in the event that none of the routes match, making it easy to integrate the 404 page with the style of your overall website:

```
route {
    path("/users/{userId}") { params ->
        // ...
    }
    notFound {
        h1().text("Page not found!")
    }
}
```

6.3 Modifying the URL

You can obtain *and modify* the URL of the current page using `url(simpleUrlParser)` within the Kweb `{block}`. This returns a `KVar<URL>` which you can use to read and *modify* the page URL:

```
import io.kweb.Kweb
import io.kweb.dom.element.creation.tags.a
import io.kweb.dom.element.new
import io.kweb.routing.route
import io.kweb.state.*

fun main() {
    Kweb(port = 16097) {
        doc.body.new {
            val path = url(simpleUrlParser).path
            route {
                path("/") {
                    path.value = "/number/1"
                }
            }
        }
    }
}
```

(continues on next page)

(continued from previous page)

```
    }
    path("/number/{num}") { params ->
        val num = params.getValue("num").toInt()
        a().text(num.map {"Number $it"}).on.click {
            path.value = "/number/${num.value + 1}"
        }
    }
}
}
```

If you visit <http://localhost:16097/> the URL will immediately update to <http://localhost:16097/number/1> without a page refresh, and you'll see a hyperlink with text "Number 1". If you click on this link you'll see that the number increments (both in the URL and in the link text), also without a page refresh.

An even more elegant approach that would also work would be to replace:

```
path.value = "/number/${num.value + 1}"
```

... with ...

```
num.value++
```

This would have the exact same effect because the KVars always work bidirectionally, so can be used both to read and modify that part of the page URL, resulting in an automatic re-render of the necessary DOM elements.

7.1 Overview

Kweb integrates nicely with [Shoebox](#), a key-value store that supports the observer pattern, and a sister project to Kweb. Shoebox has both in-memory and persistent (filesystem) engines.

In the future Shoebox will support back-end cloud services like [AWS Pub/Sub Messaging](#) and [Dynamo DB](#), which would enable unlimited scalability.

We'll assume you've taken a minute or two to review [Shoebox](#) and get the general idea of how it's used.

7.2 Shoebox and State

This example shows how *toVar* can be used to convert a value in a Shoebox to a *KVar*:

```
fun main() {
    data class User(val name : String, val email : String)
    val users = Shoebox<User>()
    users["aaa"] = User("Ian", "ian@ian.ian")

    Kweb(port = 16097) {
        doc.body.new {
            val user = toVar(users, "aaa")
            ul().new {
                li().text(user.map {"Name: ${it.name}"})
                li().text(user.map {"Email: ${it.email}"})
            }
        }
    }
}
```

7.3 Other Databases

Kweb doesn't require you to use Shoebox, you're free to use any database, either directly, or via a database abstraction layer of your choosing.

7.4 Working Example

For a more complete example of using Shoebox for persistent storage see the [to do demo](#).

Kweb has out-of-the-box support for the excellent [Fomantic UI](#) framework, which helps create beautiful, responsive layouts using human-friendly HTML.

8.1 Getting started

First tell Kweb to use the Fomantic UI plugin:

```
import io.kweb.plugins.fomanticUI.*

fun main() {
    Kweb(port = 16097, plugins = listOf(fomanticUIPlugin)) {
        // ...
    }
}
```

Now the plugin will add the Fomantic CSS and JavaScript code to your website automatically.

Let's look at one of the simple examples from the [Fomantic UI](#) documentation:

```
<div class="ui icon input">
  <input type="text" placeholder="Search...">
  <i class="search icon"></i>
</div>
```

This translates to the Kotlin:

```
import io.kweb.plugins.fomanticUI.*
import io.kweb.dom.element.creation.tags.InputType.*

fun main() {
    Kweb(port = 16097, plugins = listOf(fomanticUIPlugin)4) {
        div(fomantic.ui.icon.input).new {
```

(continues on next page)

(continued from previous page)

```
        input(type = text, placeholder = "Search...")
        i(fomantic.search.icon)
    }
}
```

Take a look at the [Fomantic UI documentation](#) to see everything else it can do.

8.2 Other UI Frameworks

It's easy to create Kweb plugins for many JavaScript tools and frameworks, taking full advantage of Kotlin's DSL capabilities.

The [Fomantic UI plugin implementation](#) itself can serve as an example.

8.3 Example and Demo

See a simple app built using Fomantic UI and Kweb (with source): <http://demo.kweb.io:7659/>

Frequently Asked Questions

9.1 Won't Kweb be slow relative to client-side web frameworks?

No, Kweb's `immediate events` allows you to avoid any server communication delay by responding immediately to DOM-modifying events.

Kweb is designed to be efficient by default, minimizing both browser and server CPU/memory.

If you encounter a situation in which Kweb is slow please [submit a bug](#).

9.2 What's the difference between Kweb and Vaadin?

Of all web frameworks we're aware of, `Vaadin` is the closest in design and philosophy to Kweb. In many ways Kweb is a philosophical descendant of Vaadin. This makes Vaadin one of the most useful frameworks to compare Kweb to, as there are also very important differences:

- Kweb is *far* more lightweight than Vaadin. At the time of writing, `kwebio/core` is about 4,351 lines of code, while `vaadin/framework` is currently 502,398 lines of code, almost a 100:1 ratio!
- Vaadin doesn't have any equivalent feature to Kweb's `immediate events`, which has led to frequent `complaints` of sluggishness from Vaadin users because a server round-trip is required to update the DOM.
- Vaadin brought a more desktop-style of user interface to the web browser, but since then we've realized that users generally prefer their websites to look like websites.
- This is why Kweb's philosophy is to be a thin interface between server logic and the user's browser, leveraging existing tools from the JavaScript ecosystem `when it makes sense`.
- Kweb was built natively for Kotlin, and takes advantage of all of its language features like `coroutines` and the flexible DSL-like syntax. Because of this Kweb code can be a lot more concise, without sacrificing readability.
- In Vaadin's favor, it has been a commercial product since 2006, it is extremely mature and has a vast developer ecosystem, while Kweb is still pre-1.0.

9.3 Is there a larger working example?

Yes, here is a simple `todo list` implementation which demonstrates many of Kweb's features.

You can find a copy of this demo running here: <http://demo.kweb.io:7659/>

It's running on a \$50/month EC2 instance. Try visiting the same list URL in two different browser windows and notice how they synchronize in realtime.

9.4 How do I enable HTTPS?

Very easily, please see [this example](#).

9.5 What about templates?

Kweb replaces templates with something better - a typesafe HTML DSL embedded within a powerful programming language.

If you like you could separate out the code that interfaces directly to the DOM - this would be architecturally closer to a template-based approach, but we view it as a feature that this paradigm isn't forced on the programmer.

9.6 Why risk my project on a framework I just heard of?

Picking a framework is stressful. Pick the wrong one and perhaps the company behind it goes out of business, meaning your entire app is now built on something obsolete. We've been there.

Kweb's development is driven by a community of volunteers. We welcome contributions from anyone, but Kweb doesn't depend on any sponsoring company.

Because of the powerful abstractions it's built on, Kweb also has the advantage of simplicity (<5k loc). This makes it easier for people to contribute, and less code means fewer bugs.

That said, Kweb is still pre-1.0, one of the implications being that we can and will make breaking API changes, and new releases are quite frequent.

9.7 How is "Kweb" pronounced?

One syllable, like "queue" and "web" smashed together.

9.8 I can't say "Kweb" to my boss!

Find a new job.

9.9 Can Kweb be embedded in an existing Ktor app?

Yes! Please see [this example](#).

9.10 I have a question not answered here

Feel free to ask us a [question](#) on Github Issues.