

| Area      | Low effort item  | Blurb   | Feasible? | Notes  |
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| UX design | <a href="#">2.4 Consider Sustainability In Early Ideation</a>            | <p>While some things require the use of electricity, during the early ideation phase you could consider wireframing or rapid prototyping (using paper) among other offline tools to reduce energy consumption. Even the electronic versions of these may have a lower carbon cost than committing to building a full-blown experience for each idea.</p> <p><b>Success Criterion - Wireframes And Prototypes</b><br/>Utilize wireframes, user-testing, and rapid prototyping to quickly build consensus, reduce risk, and lower the number of resources needed to build features.</p>   | Yes       | Actionable during summer?  |
|           |  | <p><b>Success Criterion - Navigation And Search</b><br/>Provide an accessible, easy-to-use navigation menu with search features that help visitor's easily find what they need.</p> <p><b>Success Criterion - Navigable Sitemaps</b><br/>Implement an efficient (human-readable) sitemap that is organized and regularly updated helps search engines better index website content, which helps visitor's more quickly find what they are looking for.</p> <p><b>Success Criterion - New Content</b><br/>Provide a way for visitor's to find out about new content and services.</p>  |           |  |
| UX design | <a href="#">2.8 Ensure Navigation And Way-finding Is Well-structured</a> | <p>Time is precious, wasting a visitor's will cause frustration and lead to abandonment or resentment. Additionally, the more time a visitor spends in front of a screen, the more energy they utilize. As such, throwing stuff in front of the visitor vying for their attention might sound like good business (even though we know due to banner blindness it rarely works), it mostly damages the environment and dissuades the visitor.</p> <p><b>Success Criterion - Respecting Attention</b><br/>Respect a visitor's attention by allowing them to easily control how (and when) they receive information.</p> <p><b>Success Criterion - Avoid Distraction</b><br/>Prioritizes features that don't distract people or unnecessarily lengthen the time they spend using the product or service.</p> <p><b>Success Criterion - Avoid Attention-keeping</b><br/>Avoid using infinite scroll or related attention-keeping tactics.</p> | Yes       | Some of this is quite contingent on Moodle itself, however this could be actionable within individual Moodle sites to a certain degree |
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| UX design | <a href="#">2.10 Use Recognized Design Patterns</a>                        | <p>Visitor's can identify patterns fairly easily, and they like browsing websites and apps and feeling as if they know what they are dealing with. As such, focusing your efforts on producing a product or service that is clean and has key components in easy to recognize locations (and visuals) will allow faster user-experiences and fewer emissions.</p> <p><b>Success Criterion - Design Patterns</b><br/>Provide only essential components visible at the time they are needed. Where appropriate, interfaces should deploy visual styles (patterns) that are easily recognized and used.</p>   | Yes | During the summer?   |
|           |  | <p>Everyone should be able to understand what you've written without wasting time staring at a screen or jumping from page-to-page looking for answers, whether they have accessibility requirements or not. This also means avoiding using technical language (without explanations) and including enough information to help direct people (and search engines) from page to page.</p> <p><b>Success Criterion - Write Clearly</b><br/>Write clearly using plain, inclusive language delivered at an easy-to-understand reading level considering accessibility and internationalization inclusions as required (for example, dyslexia).</p> <p><b>Success Criterion - Content Formatting</b><br/>Deliver content formatted in ways that support how people read online, including a clear document structure, visual hierarchy, headings, bulleted lists, line spacing, and so on.</p> <p><b>Success Criterion - Search Engine Optimization (SEO)</b><br/>Prioritize SEO at early design stages and throughout a product or service's lifecycle to improve content findability.</p> | Yes | No reason why this shouldn't be possible and AI tools (ie Hemingway app) can help immensely. |
| UX design | <a href="#">2.14 Write With Purpose, In An Accessible, Easy To Underst</a> |  |     |  |

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|           |   | <p>Of all the data which comprises the largest over-the-wire transfer rates within the average website or application, images are usually those which are responsible due to their quantity and usefulness. As such, doing all you can to reduce their size and unnecessary loading will be beneficial for reducing emissions.</p> <p><b>Success Criterion - Need For Images</b><br/>Assess the need for images considering the quantity, format, and size necessary for implementation.</p> <p><b>Success Criterion - Optimize Images</b><br/>Resize, optimize and compress each image (outside the browser), offering different sizes (for each image) for different screen resolutions.</p> <p><b>Success Criterion - Lazy Loading</b><br/>Provide Lazy Loading to ensure image assets only loads when they are required.</p> <p><b>Success Criterion - Sizing And Deactivation</b><br/>Let the visitor select the display size, and provide the option to deactivate images.</p> <p><b>Success Criterion - Management And Usage</b><br/>Set up a media management and use policy to reduce the overall impact of images, with criteria for media compression and file formats.</p> |       |   |
| UX design | <a href="#">2.15 Take a More Sustainable Approach To Image Assets</a> |  | yes   | Perhaps on not all of the criteria but I think even just 1 & 2 would be a good start. |
|           |   | <p>Animation can be both CPU and GPU intensive and have implications for accessibility. While visually appealing and useful in certain situations, care and attention should be taken when considering the use of a high emissions' technology.</p> <p><b>Success Criterion - Need For Animation</b><br/>Use animation only when it adds value to a visitor's experience, and not for decorative elements.</p> <p><b>Success Criterion - Avoid Overburdening</b><br/>Progressively display an appropriate quantity of animation so as not to overburden the visitor or diminish expected device behavior.</p> <p><b>Success Criterion - Control Animation</b><br/>Allow visitor's to start, stop, pause or otherwise control animated content.</p>   |       |   |
| UX design | <a href="#">2.17 Take a More Sustainable Approach To Animation</a>    |  | Maybe | How much are we using it anyway?  |

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|           |   | <p>Since the advent of the modern web, the ability to include embedded fonts and provide a more customized experience has seen their use explode. They aren't always the most performant option (which poses emissions hazards) and come with a few issues such as Flash Of Unstyled Content (FOUC) / Flash Of Unstyled Text (FOUT) which should be addressed.</p> <p><b>Success Criterion - Default Typefaces</b><br/>Use standard system level (web-safe / pre-installed) fonts as much as possible.</p> <p><b>Success Criterion - Font Optimization</b><br/>Ensure the number of fonts, and the variants within typefaces (such as weight and characters) are limited within a project, using the most performant file format available.</p>  | maybe | Pretty sure Moodle actually only allows certain fonts anyway?  |
| UX design | <a href="#">2.18 Take a More Sustainable Approach To Typefaces</a>          | <p>It's understandable that businesses want to know more about their customers, but a key part of sustainability is being ethical towards visitors and as such, the right to privacy is considered paramount. Don't demand information when it's not required and not only will this help visitors complete transactions quicker (reducing emissions), it will help with legal compliance such as GDPR.</p>  | n/a   | Don't really use forms on Moodle anyway?   |
| UX design | <a href="#">2.22 Give Useful Notifications To Improve The Visitor's Jou</a> | <p>Notifications whether through the browser or through messaging can be potentially useful, but only used in moderation. Spam and the lack of control are contributing sources of Internet emissions and as such, businesses should aim to reduce such actions.</p> <p><b>Success Criterion - Notification Justification</b><br/>Remove non-essential notifications while justifying and reducing the practice of e-mailing or text messaging to what is strictly necessary. Useful notifications (such as alerts for new content) should be used with care and restraint.</p> <p><b>Success Criterion - Notification Control</b><br/>Let the visitor control notifications (for example through the browser, SMS, or by email) and adjust messaging preferences, and the option to unsubscribe, logout, and close account should be available and visible.</p> <p><b>Success Criterion - Prompts And Responses</b><br/>Help visitor's manage expectations by clearly explaining the result of a potential input through helpful prompts and messages that explain errors, next steps, and so on.</p> | maybe | Maybe something here around announcements, teaching how to use digest, using groups for announcements, not quickmail etc. etc. |

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|               |  | <p>Printing or downloading documents can both be a net benefit and a net cost in terms of sustainability as it can reduce repeat requests to websites, but the act of printing (especially when unoptimized) wastes valuable ink and paper.</p> <p><b>Success Criterion - Printing Documents</b><br/>Design documents to limit the printing impact. If the production of paper documents is essential, it should be designed to limit its impact to the lowest possible. Create a CSS Print stylesheet and test it with different types of content. Ensure PDF printing is encouraged over paper-based storage.</p> <p><b>Success Criterion - Optimize Documents</b><br/>Offer optimized, compressed documents in a variety of accessible file formats.</p> <p><b>Success Criterion - Labels And Choice</b><br/>Display clearly the document name, a summary, the file size, and the format, allowing the visitor a choice if possible of both the format, and the language (if not the same as the web page). Furthermore, be sure to avoid embedding the document within Web pages (provide a direct link to download or view within the browser instead).</p> | Yes   |   |
| UX design     | <a href="#">2.23 Reduce The Impact Of Downloadable Or Physical Docu</a>    |  |       |   |
|               |  | <p>Try to ethically measure how efficient a visitor's experience is, by doing so you might be able to reduce any issues they may have encountered previously and reduce the energy burden of loading unnecessary pages.</p> <p><b>Success Criterion - Measurement And Compliance</b><br/>Only collect the data required to provide a streamlined and effective user-journey, put policies in place to ensure strict adherence, and comply to relevant accessibility policies and privacy laws, such as General Data Protection Regulation (GDPR).</p>  | n/a   | Moodle collects analytics anyway?                         |
| UX design     | <a href="#">2.26 Analyze The Performance Of The Visitor Journey</a>        |  |       |   |
|               |  | <p>Occasionally, you may find that features you have developed for a product or service have little to no active users or could be better implemented to bring better value. Undertaking research to identify redundancy allows you to optimize your codebase (and reduce emissions).</p> <p><b>Success Criterion - Usage Changes</b><br/>Consider visitor feedback and monitor adoption and churn rates of product or service features, incorporating insights into future releases.</p>  | Maybe | During the year before summer?                            |
| UX design     | <a href="#">2.27 Incorporate Value Testing Into Each Major Release-cyc</a> |  |       |   |
|               |  | <p>Whitespace holds no value when it's being presented to the visitor (unless they view the source code), by using minification, valuable data savings can be made which will reduce loading times.</p> <p><b>Success Criterion - Minify Code</b><br/>All source code is minified upon compilation (including inline code).</p>  | Maybe | More advanced depending on whether people are using code? |
| Web Developme | <a href="#">3.2 Minify Your HTML, CSS, And JavaScript</a>                  |  |       |   |

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| Web Development | When dealing with heavy components (such as JavaScript), the ability to modularize them into smaller pieces which can be loaded as and when required reduces the amount of redundancy and serves as a great way to make your scripts more sustainable.                               |    |                           |
|                 | <b>Success Criterion - Code Splitting</b><br>Breakdown bandwidth heavy components into segments that can be loaded as required.  | No | One for the central team? |
| Web Development | The ability to work around render blocking issues is a great addition to the web. From deferring code, to lazy loading, to asynchronously loading, each has its own use-case and each can have the potential to reduce give performance benefits to a website or application.        |    |                           |
|                 | <b>Success Criterion - Asynchronous Code</b><br>All external assets should be deferred or set to async (unless required) to avoid FOUC (Flash Of Unstyled Content).  |    |                           |
| Web Development | <b>Success Criterion - Priority Loading</b><br>If external resources are required on load, ensure their priorities (delivery route) are set correctly  | No | Moodle config             |
|                 | Helping visitors avoid wasting their time can reduce the number of emissions from time spent in front of a screen. As such, by using existing technologies like metadata, robots files, and accessibility friendly aids within the page, improvements to the experience can be made. |    |                           |
| Web Development | <b>Success Criterion - Metadata And Microdata</b><br>Optimize your metadata and microdata for search engines and social media.   |    |                           |
|                 | <b>Success Criterion - Search Engines</b><br>Assist search engines, while blocking any ill intentioned robots and scripts.   |    |                           |
| Web Development | <b>Success Criterion - Accessibility Aids</b><br>Offer accessibility and usability aids to find content, such as skip links and signposts.   | No | Moodle config             |
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| <p>Web Development <a href="#">3.11 Validate Form Errors And External Input</a></p> | <p>Entering information on a page can lead to problems. If a visitor makes a mistake along the way, it makes good sense to have systems in place to guide them through resolving the typos, confusion, and glitches that can occur which lead to abandonment and extra emissions.</p> <p>Success Criterion - Error Validation<br/>Errors should be identified through live validation as well as upon submission.</p> <p>Success Criterion - Label Elements<br/>Required elements should be clearly identified and labeled (for the benefits of voice tools such as screen readers and virtual assistants), and optional elements (if unnecessary) removed.</p> <p>Success Criterion - Allow Paste<br/>Always allow pasting of content (including passwords) from external sources.</p> | <p>No</p>    | <p>Moodle config</p>                |
| <p>Web Development <a href="#">3.12 Use Metadata Correctly</a></p>                  | <p>Search engines and social networks make use of the content within a website, by ensuring that your metadata is correctly marked up, you can reduce emissions by improving way-finding.</p> <p>Success Criterion - Required Elements<br/>Include the required title element, plus any optional HTML head elements (such as link).</p> <p>Success Criterion - Meta Tags<br/>Include necessary meta tag references which search engines and social networks recognize, using a recognized name scheme such as Dublin Core Metadata Initiative (DCMI), Friend Of A Friend (FOAF) or RDFa.</p> <p>Success Criterion - Structured Data<br/>Embed Microdata, Structured Data (Schema) or Microformats within your pages.</p>  | <p>No</p>    | <p>Moodle config</p>                |
| <p>Web Development <a href="#">3.13 Use CSS Preference And Media Queries</a></p>    | <p>Website emissions can be generated in numerous ways, some of the latest which can be controlled are through CSS preference queries. By offering the ability to stop animation, remove colors, give a print friendly format, adjust to the available lighting or even offer a less bandwidth hungry version of a page (based on visitor demand), we can provide a less impactful journey.</p> <p>Success Criterion - CSS Preference Queries<br/>Account for light-level, monochrome, prefers-contrast, prefers-color-scheme, prefers-reduced-data, prefers-reduced-motion, print &amp; scripting CSS preferences.</p>   | <p>Maybe</p> | <p>Could be done via recite me?</p> |

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| <p>Web Development <a href="#">3.14 Develop A Mobile-first Layout</a></p>                 | <p>Visitor's approach our products and services on a wide variety of devices these days. Ensuring that your device works on the widest range of devices and differing screen resolutions ensures that you will have a compatible website or application. As such, visitor's can actively choose to browse on devices which emit less carbon if they wish.</p> <p>Success Criterion - Mobile-First<br/>Allow a website or app to work on mobile devices primarily (testing with various connection speeds), expanding to accommodate larger displays thereafter (mobile-first). It is much more effective to do the hard work to ensure that it works well on a mobile device and then scale it up to larger interfaces.</p> <p>Success Criterion - Responsive Design<br/>Utilize progressive enhancement and responsive web design to ensure that your work accommodates a device's capabilities, different screen sizes, and will not fail if it meets an unsupported technology.</p> <p>Success Criterion - Alternative Browsing<br/>Consider supporting other indirect methods of interaction such as voice (speech), code (QR, etc), reader view (browser, application, or RSS), or connected-technology (watch, appliance, transport, etc).</p> | <p>Yes</p> | <p>Mobile isn't first but I think it is factored into how most design for Moodle? Perhaps the Moodle app is where this comes in?</p> |
| <p>Web Development <a href="#">3.17 Manage Dependencies Appropriately</a></p>             | <p>Success Criterion - Dependency Management<br/>Prevent developers from downloading and installing JavaScript libraries to run locally (client-side) when they are not needed by checking for unused dependencies and uninstalling those that aren't needed and removing them from your package.json file.</p> <p>Success Criterion - Dependency Necessity<br/>Reduce the amount of JavaScript that has to be downloaded and parsed by the browser by only using libraries where necessary. Consider whether you can use a native JavaScript API instead. Check the package size using a tool like Bundlephobia, and whether individual modules can be installed and imported rather than the whole library.</p> <p>Success Criterion - Dependency Updates<br/>Regularly check dependencies and keep them up-to-date.</p>   | <p>No</p>  | <p>Cental team?</p>  |
| <p>Web Development <a href="#">3.18 Include Files That Are Automatically Expected</a></p> | <p>Search engines and browsers regularly examine websites, requesting specific files by default (they expect them to exist). If the files don't exist, this will lead to potential errors and emissions being caused when they could be created, especially as the files offer SEO, user-experience and other benefits to visitor's.</p> <p>Success Criterion - Expected File Formats<br/>Take advantage of the favicon.ico, robots.txt, opensearch.xml, site.webmanifest and sitemap.xml documents.</p>   | <p>N/a</p> | <p>We're behind a "paywall"</p>  |



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| Web Development         | <p>There are several small assets which can be included within a website, conferring a range of benefits upon the website or application that utilizes them. They each have a low carbon footprint, so while they do create emissions, it's worth including them for the benefits they provide.</p>  |       |                          |
|                         | <p>Success Criterion - Beneficial File Formats<br/>Utilize standards such as ads.txt, carbon.txt, humans.txt, security.txt and robots.txt.</p>   | No    | Moodle config            |
| Web Development         | <p>Ensuring that your code is free of redundancy by using pre-existing functionality provided by the web browser is important as it will help you to reduce the amount of time wasted, re-creating the same components, this offers obvious sustainability benefits in terms of time in front of the screen.</p>   |       |                          |
|                         | <p>Success Criterion - Native Over Custom<br/>Use native functions, API's and features over writing your own.</p>  | Maybe |                          |
| Web Development         | <p>Making multiple requests whether HTTP or within a database has a carbon cost as infrastructure has to send that information back and forth. As such, managing how you store and use data locally for a visitor will help reduce wasted cycles.</p>  |       |                          |
|                         | <p>Success Criterion - Database Queries<br/>If you need information that is stored in a database, and you require it more than once in your code, access the database only once, store the data in a variable for subsequent processing.</p>   | No    | Moodle config            |
| Hosting, infrastructure | <p>Every file will take up a certain amount of room on a server's hard drive, and this data will need to be sent across-the-wire to each visitor. Doing so will consume resources, but by using compression algorithms you can shrink each file to make its journey less ecologically impactful.</p>   |       |                          |
|                         | <p>Success Criterion - Server-side Compression<br/>If using a CMS, install an applicable plugin to enable on-the-fly server-side compression, such as Brotli or GZIP. Otherwise, use the provided server configuration files to include and tweak the performance related features to the requirements.</p> <p>Success Criterion - Media Compression<br/>Compress your various images, fonts, audio, and video; by reducing the quality and offering different resolutions / dimensions (sizes) before uploading to a server or content management system.</p> | Maybe | On the media compression |

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| Hosting, infrastr | <p>Navigation errors lead to mistakes, which lead to visitor's wasting time trying to resolve them, or abandoning a website altogether. Anything that can be done to interject, predict and way-find around potential problems will reduce emissions over time.</p> <p>Success Criterion - Error Pages<br/>Maintain sites by ensuring links are correct, and if errors occur, provide suitable way-finding within optimized pages for each error type to ensure resources can be identified to help a visitor to complete the task they started.</p> <p>Success Criterion - Redirection<br/>Redirect websites, subdomains, and pages only when necessary. Proactively seek broken or outdated links and fix them. A redirect or search will often help reduce the number of pages a visitor needs to load.</p> | Maybe | One for me re Technical Moodle but one for moodle config re error messages |
| Hosting, infrastr | <p>Decommission or switch off additional environments, such as testing / Quality Assurance QA) / re-production and other such environments when they are not useful.</p> <p>Success Criterion - Unused Environments<br/>Ensure no unused environment is available, balancing the cost of deploying an environment with the cost of keeping it online while unused.</p>   | No    | Central team   |
| Hosting, infrastr | <p>Only send data from the server when the visitor needs it. As much as possible, you can rely on client-side or server-side cache and client-side / local storage. Rather than refreshing data on a given frequency, it might be up to the visitor to manually ask for a refresh.</p> <p>Success Criterion - Refresh Frequency<br/>Frequency for refresh (of both the cache, locally stored data, and the page) is defined depending on visitor needs.</p>  | No    | Moodle config  |
| Hosting, infrastr | <p>For security reasons and in accordance with an SLA (Service-Level Agreement), it is often recommended to duplicate data to make sure it remains available if a problem occurs. This should be balanced with the cost of such duplication. Not all data is critical and, rather than overcompensating with multiple saves, duplication should be designed with efficiency in mind.</p> <p>Success Criterion - Data Backups<br/>Backups of system and user data are both incremental and secure.</p>  | Yes   | Decisions about backing up Moodle sites?                                   |
| Hosting, infrastr |  | Maybe | Check about Bootstrap, Fontawesome etc CDNs                                |

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| Hosting, infrastructure | Create data with an expiration date. Excess data is a form of technical debt, and routinely cleaning up old data needs to be normalized.   |       |  |
|                         | Success Criterion - Classify And Tag<br>Use a data classification / tagging policy to make it easier to find, handle and remove.   |       |  |
|                         | Success Criterion - Justify Storage<br>Store data only when it is difficult to recreate.   |       |  |
|                         | Success Criterion - Optimize Logging<br>Optimize log collection, storage (off-site) and rotation; scheduling during low-activity hours and using carbon-neutral backup providers.  |       |  |
|                         | Success Criterion - Compress Storage<br>Enable storage compression both on the fly (Brotli or GZIP) and with long-term assets made available for download.   | No    |  |
| Business strategy       | Having someone within an organization who represents sustainability as a core agenda makes good sense due to the accessibility, performance, financial and other benefits which can occur from following best practices.   |       |  |
|                         | Success Criterion - Ecological Referee<br>Choose and assign an ecological referee (with specific digital expertise) for the product or service within your organization.   | Maybe | Not an individual action but something we can do in teams? |
| Business strategy       | The organization has clearly defined governance policies around how it manages and maintains digital products and services over time.  |       |  |
|                         | Success Criterion - Management And Maintenance<br>The organization has documented policies outlining how it approaches product management and maintenance.   |       |  |
|                         | Success Criterion - Planning Strategy<br>The organization has maintenance / security plans in place for all the digital products and services it manages.  |       |  |
|                         | Success Criterion - Resourcing Products<br>The organization appropriately resources products over time via staffing and budgeting to support refactoring code, addressing technical debt, new product features, ongoing testing, and product or service maintenance plans to continue supporting its customers, visitor's, and other stakeholders. |       |  |
|                         | Success Criterion - Resource Measurement<br>The organization incorporates carbon and resource measurement into maintenance programs and can show measurable improvement over time.   | No    | Central team   |

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| Business strategy | Products or services update regularly, ensure that additions, changes, deprecations, removals, fixes, or security patches are documented in an easy-to-read document with details that showcase how such changes affect the visitor (or how they can take advantage of new features). |     |              |
|                   | Success Criterion - Feature Changes<br>The user-experience considers possible changes to the product or service such as adding, updating, or removing features.   | No  | Central team |
| Business strategy | Ensure that the product or service you are creating offers value to visitor's and doesn't duplicate existing functionality (without bringing something new to the table) as this redundancy wastes digital and physical resources.  |     |              |
|                   | Success Criterion - Sustainable Development Goals<br>Review and identify whether your product or service aligns with one of the U.N. (SDG's).   |     |              |
|                   | Success Criterion - Creation Evaluation<br>Evaluate the desirability, feasibility, and viability of the digital product or service they wish to create to ascertain whether it is necessary.  |     |              |
|                   | Success Criterion - Avoid Duplication<br>Determine that no existing digital product or service offers the same value. They have conducted analysis to understand whether a new product or service is necessary.   |     |              |
|                   | Success Criterion - Obstacle Consideration<br>Consider any obstacles to using a product or service, such as accessibility, equality, technical, or territorial.   | Yes |              |

[5.13 Document Future Updates And Evolutions](#)

[5.14 Establish If A Digital Product Or Service Is Necessary](#)