Designing for the Next Billion: A Scorecard of Best Practices

What is this tool? A comprehensive synthesis, in the form of a checklist scorecard, of evidence-based best practices from leaders in designing appropriate digital services and tools for the next billion users, or those in developing countries/emerging markets with no, slow and/or unreliable internet connectivity. The scorecard presents a checklist of 186 detailed technical specifications and instructions rather than general principles, and is categorized into 15 topics listed in the sequence of development workflow. The tool allows its users to review all known best practices together at a glance, without having to consult and compare multiple publications, and "score" their product against them.

How do I use it? Designers/developers review checklist items as a guide per their stage in the development process. Then, they check off each item completed, with the goal of checking off as many items as possible, ensuring their design complies with as many best practices as possible. Finally, they tally up the number of checked items to determine their "score". For more detailed information, consult the original sources (Google, Android, and UNESCO) synthesized in the scorecard; each item listed indicates its original source. Consider sending an endorsement letter to Digital Principles formally and publicly acknowledging your commitment to designing to reach more people with greater impact and stronger, more sustainable outcomes. Researchers may use the scorecard to prioritize topics in need of further study.

What have we missed? Contribute to the scorecard by submitting evidence-based new or overlooked guidelines/checklist items to mobileteacher.org@gmail.com.

✔	**Research: Learn about users, their community, and how they use technology**	Google	Android	UNESCO
	Design with all the users, focusing on their needs and context of where and how product will be used	●		●
	Conduct desk research to deepen the broad understanding of the users and their context. For example, note at a national level the literacy rates and mobile uptake statistics			●
	Map the ecosystem to identify and understand all the stakeholders and factors that must be considered in the whole solution design			●
	Connect with the people you're building for with in-person/immersion trip research that includes team members from different backgrounds and disciplines	●		
	Collaborate with people in local communities throughout the product cycle to ensure a more responsible, inclusive process/leverage local expertise	●		
	Work through well-trusted intermediaries, such as local non-profit organizations embedded in the local community with staff who speak the language			●
	Provide sufficient training and briefing to local facilitators			●

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	Create user personas, which are fictitious characterizations that capture, in a relatable way, the key attributes – such as demographics, knowledge, attitudes, practices and motivations – of the target users			●
	Check assumptions by expanding the idea of “average” or “target” user in design choice, onboarding, and marketing	●		
	Draw a user journey map of the end-to-end activities and processes of the users to show the full set of steps and possible paths to achieve a particular outcome			●
	Develop user scenarios for key moments in the user journey, which detail specific user needs in clear, action-oriented “stories”			●
	When selecting an international survey method, consider factors like mobile-first users, multiple language needs, and low-internet penetration	●		
	Use remote research tools to gather feedback from users	●		
	Where possible, conduct field studies in familiar but neutral and distraction-free spaces, where participants can feel freer to provide honest responses			●
	Share insights through storytelling, not just data	●		
	Define design principles early to establish product vision and direction	●		
	Design empathetic experiences	●		
Score: / 17				
Technical Specifications				
✔	**Connectivity: Handle mixed connectivity (offline and slow connection)**	Google	Android	UNESCO
	Notify user when connectivity is essential for task, not when it’s been lost		●	
	Batch up network requests for when connectivity restored		●	
	Store data locally, queue/cache requests, easily-downloadable images		●	
	Use network managers and content providers to store data on disk so it performs regardless of network conditions		●	
	Use local database for long-lived data		●	
	Use a bounded disk cache for transitory data		●	

	Prioritize network requests to reduce user wait time, sequencing requests so text is fetched before rich media		●	
	Detect network quality to tailor use of networks/adjust app behavior		●	
	Accommodate connectivity when a network switches from WiFi to 3G to 2G to no connectivity	●		
	Support local caching of form inputs to avoid losing data and frustrating users	●		
	Test app in airplane mode to simulate a lack of connectivity	●		
Score: / 11				
✔	**Offline Design: Allow offline usage and indicate status**	Google	Android	UNESCO
	Minimize data load as much as possible, allowing for offline usage so that users can download/upload data when a connection is available			●
	Implement responsive design so that apps and services work on a range of devices, including low-end ones			●
	Clearly indicate offline functionality with an icon and the word “offline”/signify what offline icons mean by also using text	●		
	Show the offline pin icon when user has downloaded content for offline use but is still online	●		
	Display offline icon when phone itself is offline	●		
	Display no functionality	●		
	Pair the “cloud off” icon with a clear text description like “no internet”	●		
	Allow downloading for future offline use	●		
	Indicate content that can be downloaded for future offline use by displaying the download icon paired with the text label, “download” and the size of the file	●		
	Make it easy to delete files, in case users want to conserve storage space on their phones	●		
	Display a remove action with a delete icon for downloaded files and show how much space will be saved by removing a file	●		
	Transition from downloading to complete/offline-ready	●		
	Use an animation to show when a file is being downloaded and when it’s	●		

	ready for offline use			
	While the file is downloading, display how many seconds it will take to download—enabling the user to cancel or pause the download	●		
	Make a tab or button on the home screen to help users easily find all of their offline files	●		
	Provide a notification to alert users when app or content is online again and able to complete their request	●		
	Use a snackbar—a single line of text directly related to the operation performed—to show that the app is waiting for a connection to download	●		
	Help users connect with each other without data (offline sharing)	●		
Score: / 17				
✔	**Device Capability: Build for different models, sizes, and conditions**	Google	Android	UNESCO
	Use density-independent pixels		●	
	Test text and graphics on ldpi and mdpi screens		●	
	Test layouts on small and medium screen sizes	●	●	
	Target the most recent version of Android and provide backward compatibility		●	
	Use Android support libraries and Google Play services		●	
	Optimize for devices running Android (Go edition)		●	
	Build for device range and lower memory footprint	●	●	
	Benchmark app's memory footprint		●	
	Avoid long-running processes	●	●	
	Ensure better contrast ratios for bright sunshine, low vision, or cracked phone screens	●		
Score: / 10				
✔	**Data Cost: Optimize the amount of data an app uses from installation, usage, and updates, to uninstallation and background services**	Google	Android	UNESCO
	Minimize app download size	●	●	
	Minimize high-bandwidth consumption, including videos, rich graphics, and	●		

	auto refresh			
	Selectively include only necessary APIs into APK		●	
	Use multiple APK support to split APK by density		●	
	Reduce code size		●	
	Optimize compiled code		●	
	Reduce post-install app disk use		●	
	On first use, walk user through variety of network settings/provide onboarding experience to configure network use		●	
Score: / 8				
✔	**Battery Consumption: Preserve battery life and promote efficiency with power management**	Google	Android	UNESCO
	Benchmark battery use		●	
	Avoid wakelocks		●	
	Use GcmNetworkManager to effectively schedule tasks		●	
	Monitor sensor requests and limit to preserve consumption		●	
	Minimize activity when running in the background or on battery power		●	
	Use API to manage underlying location technology, cache locations, and batch requests		●	
	Batch network activity to reduce number of device wake ups		●	
Score: / 7				
✔	**Images and Graphics: Adapt to network and memory**	Google	Android	UNESCO
	Reduce image load time and save bandwidth by serving WebP files		●	
	Request images at target rendering size		●	
	Make image size request based on network type or quality		●	
	Use dynamic/low-res placeholders while image being fetched		●	
	Use image-loading libraries		●	
	Reduce heavy graphics processing loads like animations and transitions		●	

	Use lower-res images on low-memory devices		●	
	Use scalable vector graphics (SVG)		●	
	Use WebP for non-vector images		●	
	Consider using YouTube Go for videos	●		
Score: / 10				
✔	**User Interface (UI): Aim for simple, consistent, and localized**	Google	Android	UNESCO
	Use local design to inform visual language and imagery	●		
	Accommodate variations between languages so app is easily localized, allowing for spacing, density, order, emphasis, and wording variations	●	●	
	Internationalize date, time, and other units and display according to phone settings		●	
	Provide touch feedback on all touchable elements		●	
	Create responsive interaction/screen reactions to user input		●	
	Perform network of heavy-duty operations in a background thread, keeping the UI thread as idle as possible		●	
	Represent each operation with a single activity indicator		●	
	Avoid blocking dialogs with loading indicators		●	
	Avoid empty states using starter, educational, or best match content or display non-interactive image and text tagline telling user what will be displayed		●	
	Target 60 frames per second on low-cost devices		●	
	Minimize overdraw		●	
	Use an efficient view hierarchy by avoiding complex hierarchical structures such as menus, tabs, or dropdowns and offer linear navigation	●	●	●
	Use placeholder UI or branded launch screen on slow-to-start apps to reduce perceived loading time and/or speed up app launch time		●	
	Ensure consistency of design elements as well as unified experience across platforms and device sizes using Material Design components		●	●
	Balance meaningfulness and hierarchy with the local design aesthetic that	●		

	may be vibrant and rich rather than minimalist			
	Incorporate charm and surprise elements to make utility apps less boring	●		
	Use a contrast ratio of 4.5:1 or higher for normal text, and 3:1 for large text greater than 18p	●		
	Combine color accents with other visual cues like large icons, bold outlines, strokes, or patterns rather than relying on color alone to communicate with users, provide a memory aid, and show relationships	●		●
	Ensure designs work in both portrait and landscape mode	●		
	Check visual designs through magnification and zoom, as designs often break when magnified by up to 200%	●		
	Make minimum size standards for touch targets 48x48px (or 48x48dp on Android) to help those with limited dexterity or low vision as well as those with damaged screens	●		
	Ensure interface scales down to 4” and up to 7"+ screens	●	●	
	Make text and typography elements large by default	●		
	Provide machine-automated support, such as auto-correct of text, auto-suggest or autocomplete of words being entered			●
	Ensure the input method is appropriate to the audience			●
	Experiment with innovative form factors to potentially increase interaction opportunities for users			●
	Provide constant feedback to reassure the user of their actions			●
	Allow users to pause and repeat content and adjust speed			●
	Tailor interfaces for low-skilled and low-literate users			●
Score: / 29				
✔	**User Control: Provide transparency and control**	Google	Android	UNESCO
	Let user control how app uses data, especially data-heavy apps, and tailor it to suit their needs	●	●	
	Be transparent about data consumption and allow user to control whether a product downloads over WiFi or uses data	●		
	Allow app to be moved to external (SD) storage		●	

	Offer configurable network use		●	
	Provide a network preferences screen from outside the app		●	
	Allow user to force lower-bitrate video streams on cellular networks		●	
	Provide settings to control data synching and pre-fetching		●	
	Provide controls and visibility into the device storage and allow users the easy deletion of content	●		
	Empower users when it comes to privacy, safety, and security	●		
	Make privacy controls easy to discover, access, and adjust	●		
	Explain security and data handling of personal information including how third parties can access data	●		
	Allow users who share a device to remove private content, switch accounts, use private mode	●		
	Allow users to report abuse, or take down sensitive or harmful content	●		
	Keep updates minimal and relevant, and explain its value in straightforward language	●		
Score: / 14				
✔	**Content: Ensure clarity and relevance of content especially for low-skilled and low-literate users**	Google	Android	UNESCO
	Establish the stakeholders involved in content development, which include the actual content creators; those who may need to validate the content; a representative group of end-users to test it; and, ideally, an educationalist			●
	Clearly define the content purpose, such as whether the aim is simply to inform or to change behaviour			●
	Co-develop content with the end-users to ensure that it is understandable and context-appropriate, and pre-test early content versions			●
	Test for optimal way content is delivered, in what format, through which channels and media (audio and/or text, for example), and in which style, and the volume and frequency			●
	Ensure that the choice of media and delivery channel is appropriate for all the end users, and consider a delivery channel mix to broaden access and engagement			●

	Mix media, for example accompany images and text with video or audio, to increase the possibilities for user engagement			●
	Consider how to monitor content distribution and its consumption, building in ways of tracking content, or soliciting user feedback, from the start			●
	Segment different audiences, where needed, as each group may have different information needs, preferences and skill levels			●
	Make and feature locally relevant content	●	●	
	Translate the app		●	
	Use plain words and grammar, ideally in the local language			●
	Use images that are simple, clear, and culturally relevant			●
	Make audio content containing voice slow, clear, and loud enough			●
	Ensure that content is gender sensitive			●
	Build in help or instructions about how to use the content			●
	Establish credibility by using local language content and relatable local actors and voices			●
	Support content creation by end users			●
	Mirror content to the actual application environment as closely as possible			●
	Encourage group discussions by including questions in content			●
	Aim content at multiple users on multiple planes of engagement as technology is often shared or used in a group			●
	Test content			●
Score: / 21				
✔	**Literacy: Accommodate different levels of literacy**	Google	Android	UNESCO
	Use simple, basic English and avoid jargon	●		
	Translate to languages users are most comfortable with for reading/offer content in local language of users	●		●
	Keep sentences short	●		
	Provide graphical cues/combine text with images	●		

	Allow voice input, autocomplete text fields, and browsable interfaces to minimize need to type or text search	●		
	Make app more intuitive for low-literate users by minimizing text-based inputs and eliminating hierarchies understood only through language	●		
	Allow users to communicate feelings and experiences with stickers	●		
	Focus on users' digital skills and competencies			●
	Design flexible learning pathways for users			●
	Set goals for digital skills and literacy development			●
	Benchmark and track the digital skills and competencies of users			●
	Use an established national or regional framework for mapping the digital skills and competences of the target user group, ideally in the local language and relevant to the local context			●
	Collect and analyze relevant usage data to track skills development			●
	Conduct pre- and post-usage tests to track skills			●
Score: / 14				
✔	**Accessibility and Inclusivity: Design for widest range of users**	Google	Android	UNESCO
	Identify intersectionality of possible accessibility challenges based on norms of gender, religion, class, etc.	●		
	Learn from/ask people who are accessibility experts in certain geographic regions or thematic areas	●		
	Provide progress indicators and other status changes with meaningful alternative text for those who access phones through screen readers	●		
	Test accessibility settings/test components and user flows through regularly with a variety of assistive technologies and accessibility settings turned on	●		
	Test app with a dimmed screen, in bright sunshine, and through the perspective of people who have low vision (by using vision simulation tools)	●		
	Distribute on Google Play to reach largest audience		●	
	Optimize Play listing for new markets		●	
	Support local forms of payment and emulate local business models	●		

	Respect users' budgets	●		
Score: / 9				
✔	**Testing: Field-test with real users**	Google	Android	UNESCO
	Consider bandwidth, community, and location before creating a prototype to test in the field/consider low-level prototyping first such as paper prototypes	●		●
	Test with real users in various countries as often as possible to track app performance, and insights into how to improve the user experience	●		
	Conduct user studies in the market to understand if your product is respecting social, cultural, political, and religious norms	●		
	Allow users to try your app or service for free	●		
Score: / 7				
✔	**Training and Support: Provide initial and ongoing training and support**	Google	Android	UNESCO
	Link the use of digital products and services to the aspirations and motivations of users			●
	Provide information-presentation support in the form of help pages, FAQs, tool tips and tutorials			●
	Potentially use the recent addition of chatbots into instant messaging services			●
	Provide helplines that users can call for support			●
	Leverage existing human networks for tech support and raising awareness			●
	Use local in-person training/support rather than relying on written or visual documentation alone	●		
	Build local support capacity by training local infomediaries already known and active in the community to provide tech support and one-on-one training			●
✔	**Monitoring: Constantly monitor, measure, and improve**	Google	Android	UNESCO
	Determine appropriate data elements to collect balancing goals and success metrics for the digital solution and the project as a whole against convenience and privacy of users			●
	Create multiple monitoring views such as user view, content view, and service view			●
	Ensure privacy, security and responsible management of data by protecting			●

	data collected about users and being transparent about its intended uses			
	Open data and the analysis of it to public scrutiny and in a way that does not compromise privacy of the users			●
	Complement automatically collected data with human feedback			●
	Map and serve the data needs of the full range of user stakeholders			●
	Leverage big data generation by users for sector support			●
	Ensure quality control when low-skilled users are data generators			●
Score: / 8				

Total: _____/ 186 items

Sources

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