

Practice and Reflection on Building Localized External Propaganda Websites Using Open-Source Software in the Cloud Era: Postprint

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Abstract

This paper explores an effective, technology-driven path for accelerating media platform construction, reducing costs, improving external publicity work efficiency, and enhancing communication power, by describing how to utilize open source software for the rapid, low-cost development of localized external publicity websites.

Full Text

Practice and Reflection on Building Localized External Propaganda Websites Using Open Source Software in the Cloud Era

Abstract: This paper describes how to rapidly and cost-effectively build localized external propaganda websites using open source software, exploring an effective technology-driven path that accelerates media platform construction, reduces costs, improves external propaganda efficiency, and enhances communication impact.

Keywords: open source software; localization; external propaganda website

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With the development and application of internet and computer technologies, external propaganda work faces new opportunities and challenges. Effective external propaganda requires not only compelling content that shapes a positive

international image and fosters a favorable global public opinion environment, but also effective communication methods and carriers that tell China's stories in ways that resonate with audiences, thereby enhancing international recognition of our nation. The rise of emerging technologies like the internet has made external propaganda more timely, geographically extensive, and capable of reaching larger audiences. Fully leveraging the internet's role as a bridge connecting China with the world has become an inevitable choice for external propaganda work. The advancement of internet and computer technologies not only provides technical guarantees for external propaganda but also offers approaches aligned with new media communication patterns. The construction of localized websites provides an excellent communication carrier and expression model for this work.

1.1 Clear Audience Targeting

The audience for localized external propaganda websites consists of the target country's general populace, whose direct impressions of website content determine the effectiveness of external communication. This clear audience demographic allows website construction—whether in terms of site architecture or content—to avoid the “large but comprehensive” approach of general websites and instead concentrate resources on pursuing a “small but refined” strategy.

1.2 Single-Language Focus

Large-scale websites serve more diverse audiences across broader cultural and geographic ranges, requiring support for multiple languages and more complex site structures. This creates substantial workload for redesigns and publishing, demands more powerful hardware and network infrastructure, and incurs higher construction, maintenance, and security costs. In contrast, localized external propaganda websites typically target audiences in a single country and are built in the target audience's language. Consequently, these sites usually require support for only one language, feature simpler structures, offer flexible templates, need less storage space, are easier to control in terms of costs, and allow more convenient content revisions and updates.

1.3 Personalized Styling

Due to regional and cultural differences in target countries, localized website construction is a complex undertaking. Audiences in different countries have varying cultures, customs, and social practices. During website construction, it is essential to consider not only accurate linguistic expression but also cultural preferences, religious beliefs, regional customs, education levels, value systems, and traditional habits of the target audience. As an important carrier of external propaganda, website construction must be rich in localized characteristics to better enable audiences to receive and understand the intended content subtly and effectively, truly achieving a “down-to-earth” approach. Therefore, due to different audiences, localized websites will have different personalized styles.

These characteristics—single-language distribution, relatively simple site structure, diverse personalized styling, and requirements for rapid construction and revision—provide a practical and feasible basis for adopting open source software to build localized websites.

2. Design and Implementation of Localized External Propaganda Websites

China Radio International, where the author works, conducts external propaganda in over 40 foreign languages. Each language team needs to build its own localized external propaganda website as an important tool for more effective targeted communication. Drawing from successful practical experience, this paper explores a replicable new approach to external communication that is technology-driven, rapid, efficient, low-cost, and high-impact by demonstrating how to build such websites at minimal cost using cloud technology and open source software without additional funding.

Technically, building a localized external propaganda website requires three essential elements: web hosting space, a domain name, and website programs. If we compare a website to a museum, “web hosting space” resembles the museum building—the physical space that accommodates and displays various collections. Similarly, building a localized external propaganda website requires physical space to store content, including templates, user data, audio-visual materials, and other elements needed to construct the site. “Web hosting space” forms the foundation of a website. The “domain name” is like the museum’s address—the basis for locating and finding the museum. A website needs a unique address that enables audiences to precisely locate and access it on the internet. The “website program” resembles the collections displayed to visitors and the lighting, air conditioning, water, and electrical systems that maintain normal museum operations. A website’s structure is similar: it consists of various new media materials (audio, video, text, images) that are organically combined and published as page collections through a Content Management System (CMS) according to designed templates. A complete website program comprises two parts: backend programs such as CMS, publishing systems, and databases; and frontend programs such as web pages formed by combining audio-visual materials according to site templates.

After determining these three essential elements, adjustments and optimizations can be made during the construction process based on the specific characteristics and business development needs of the localized external propaganda website.

According to design requirements, this localized external propaganda website integrates popular music, hot news, and special reports, with content displayed in four main modules while incorporating two interfaces, as shown in Figure 1 [Figure 1: see original paper].

Music: Provides on-demand popular music services in a “list + TOP20” format, primarily including Western pop music and Chinese classical music.

News: Delivers hot international news and Chinese news to target country audiences.

Special Reports: Follow-up news coverage including current affairs specials, cultural features, and coverage of major events.

Message Board: Employs a review-before-publishing model to provide audiences with communication channels while allowing editors to understand audience preferences and suggestions and filter spam messages, maintaining a relatively clean environment for the website.

The website also integrates links to the language team's official Facebook account and bilingual app, guiding audiences to follow the official account and download the app to expand communication impact.

After clarifying the three essential elements and the structure of the website to be built, we proceeded with the design and construction of the localized external propaganda website based on specific business requirements and budget constraints.

2.1 Domain Name Application and Registration

A domain name converts cumbersome, difficult-to-remember IP addresses into strings of letters and numbers that have certain meanings and are easy for audiences to remember. As an effective pathway for audiences to access websites, domain names are unique and exclusive. As an important internet resource, domain names must be applied for and registered before use, following a first-come, first-served principle. Once registered, others cannot use the domain name during its validity period. Therefore, when deciding to build a website, the first step should be selecting an appropriate domain name. Domain names fall into two categories: paid and free. How should we choose a suitable domain name?

First, we should select internationally common domain suffixes such as “.com” or “.cn.” The “.com” domain is an international top-level domain used globally, while “.cn” is a domestic top-level domain primarily used for domestic websites. Although these are paid domains, search engines treat them seriously due to their widespread use and are unlikely to penalize them. Some niche domains like “.tk,” while also top-level and free, are prone to search engine penalties due to limited usage. It is not uncommon for websites to be penalized because they chose free niche domains to save costs, resulting in losses that outweigh the savings. Second, domain names should be simple and easy to remember, which is a fundamental criterion for evaluation. Only domain names that audiences remember have real value. Finally, domain names should be meaningful, containing a website or media's culture and brand to help establish media brand value.

Current domain registration costs are minimal and negligible for website construction. Since we are building a localized external propaganda website whose audience consists of the target country's citizens and people who understand

the country’ s language and appreciate its culture, we chose the internationally universal top-level paid domain “.com.” Additionally, when purchasing domain registration services, current domain service providers also offer DNS resolution services that point the domain’ s A record to the corresponding server IP, completing domain registration and binding the domain name to the server IP conveniently.

2.2 Web Hosting Selection

Building a localized external propaganda website requires sufficient storage space for content, including audio-visual materials, website templates, and various interactive data. Under traditional conditions, this required purchasing: (1) high-performance hardware equipment to ensure efficient access and computing services; (2) sufficient bandwidth to support high concurrent access; and (3) 24/7 uninterrupted power supply. This necessitated substantial upfront investment in professional server hardware and rental of specialized data centers with adequate bandwidth and continuous power supply—procedures that were cumbersome and costly.

The development and maturation of cloud computing technology have greatly facilitated low-cost construction of localized external propaganda websites. We only need to rent a certain amount of cloud space (cloud server) based on initial website scale planning at relatively low cost, simultaneously obtaining 24/7 “server + network” resources. As website content and scale grow, additional network bandwidth and server resources can be purchased according to actual business needs, unlike traditional website building that requires large upfront investment in resources that may not be needed for many years. This improves construction efficiency and reduces costs.

Currently, cloud space (cloud servers) also comes in free and paid versions. Free cloud space is unstable and frequently unavailable, which is detrimental to localized website construction and promotion and thus not considered. Paid cloud space is divided into domestic and overseas options. In actual construction, we found that domestic cloud resources, deployed on China’ s internet infrastructure, provide fast access for editors and technical staff but suffer from slow access speeds and inaccessible pages for overseas audiences due to network environment factors. Additionally, domestic cloud space requires a cumbersome filing process. Therefore, I do not recommend domestic cloud space. Renting overseas cloud space, by contrast, offers more complete services, favorable pricing, and avoids the tedious filing process.

This practice involved building a localized external propaganda website for a specific target country (Albania). Prioritizing better user experience and feelings for the target audience, we chose to rent from the overseas cloud service provider “Amazon Web Services (AWS)” and selected a location closest to the target country—“Europe Central (Frankfurt), the nearest node available on AWS.” This allows audiences in the target country to access our website from

a relatively close distance for better user experience. Additionally, the cloud service provider offers VPN accounts that bypass firewall restrictions, providing convenient and secure access for domestic editors and technical staff to the cloud space.

2.3 Website Program Selection and Deployment

After renting “cloud space” and completing domain name registration and DNS resolution, the next step is building the localized website system on the rented “cloud space.”

We selected LNMP as the production environment. LNMP represents the website server architecture of Nginx + MySQL + PHP under the Linux operating system. Using these four free open source software components plus an appropriate Content Management System (CMS), we can build a free, efficient, and highly extensible website.

After analyzing the characteristics of localized websites and conducting requirements analysis for the website to be built, we selected “WordPress” as the CMS. WordPress, developed using PHP and MySQL, originally served blogs and gradually evolved into a content management system. WordPress offers several advantages: (1) It is a free open source program with simple setup and strong cross-platform compatibility. (2) It has massive numbers of third-party developed free templates with simple installation methods, and provides language packs including Chinese, allowing users to always find their native language and set it as the system language, lowering the usage threshold. (3) WordPress provides diverse third-party plugins that are free to use, including those for improving user experience, assisting SEO, adding website functions, enhancing security, and backing up databases and content. Proper use of these readily available plugins can greatly reduce website development difficulty, accelerate construction speed, enrich website functions, and enhance security—all at no cost.

For the localized website, we selected CentOS (a Linux distribution) as the operating system, Nginx as the web server, MySQL as the database, PHP as the server-side scripting interpreter, and WordPress as the CMS for webpage content creation and management. Frontend template production uses HTML5 + JavaScript + CSS3, achieving mobile device adaptability while ensuring template efficiency and security. Excluding labor costs, cloud space rental fees, and domain registration and resolution expenses, a stable and free website can be established without additional expenditure.

The specific implementation steps are as follows: (1) Rent AWS cloud space; (2) AWS provides multiple operating system images to choose from, including various versions of Windows and Linux—ultimately selecting CentOS 6 for one-click installation; (3) Select an appropriate instance type for website production and publishing, and configure instance details including MySQL database installation and configuration, PHP installation and configuration, Nginx installation

and configuration, and network bandwidth settings; (4) To enable remote SSH access to the instance, create and save a new key pair; (5) AWS assigns a public IP to each instance, but this IP is not fixed—to obtain a fixed IP, apply for an Elastic IP in the AWS console and associate it with the instance; (6) Install the WordPress file package; (7) Complete domain name and IP binding at the domain service provider to enable direct website access via domain name; (8) Create WordPress website templates according to design requirements and set them as the current website templates; (9) Embed links to the language team’s official Facebook account and bilingual app download addresses on the website to guide user traffic.

As shown in Figure 2 [Figure 2: see original paper], in this case, the Nginx publishing service, MySQL database, and WordPress CMS are all installed on the 50GB cloud space rented from Amazon, without separate server deployment. The topology diagram is only for illustrating the relationships between services.

Conclusion and Reflection

The development and application of computer and internet technologies have provided more communication methods and channels for external propaganda work. As people’s reliance on the internet for information increases, we should not only focus on building communication networks but also transform our thinking to disseminate existing information resources through internet models, making it easier to reach and “move” target audiences, thereby generating real impact. Through the practice of building localized external propaganda websites using open source software, this paper explores a technical approach that leverages new media technology and open source software to build localized websites, saving construction costs, reducing difficulty, accelerating speed, and improving communication effectiveness. This serves as a modest spur to induce more media industry technical professionals to actively research and master various new media technologies, using new technologies to better serve external communication efforts and maximize the role of new media technology in communication endeavors.

[1] Fu Jian. Doing a Good Job in External Propaganda and Telling China’s Stories Well [J]. Military Industry Culture, 2017

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Note: Figure translations are in progress. See original paper for figures.

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