



Report

Open Source Standardization of Government Websites in Rwanda

TYPO3 Association

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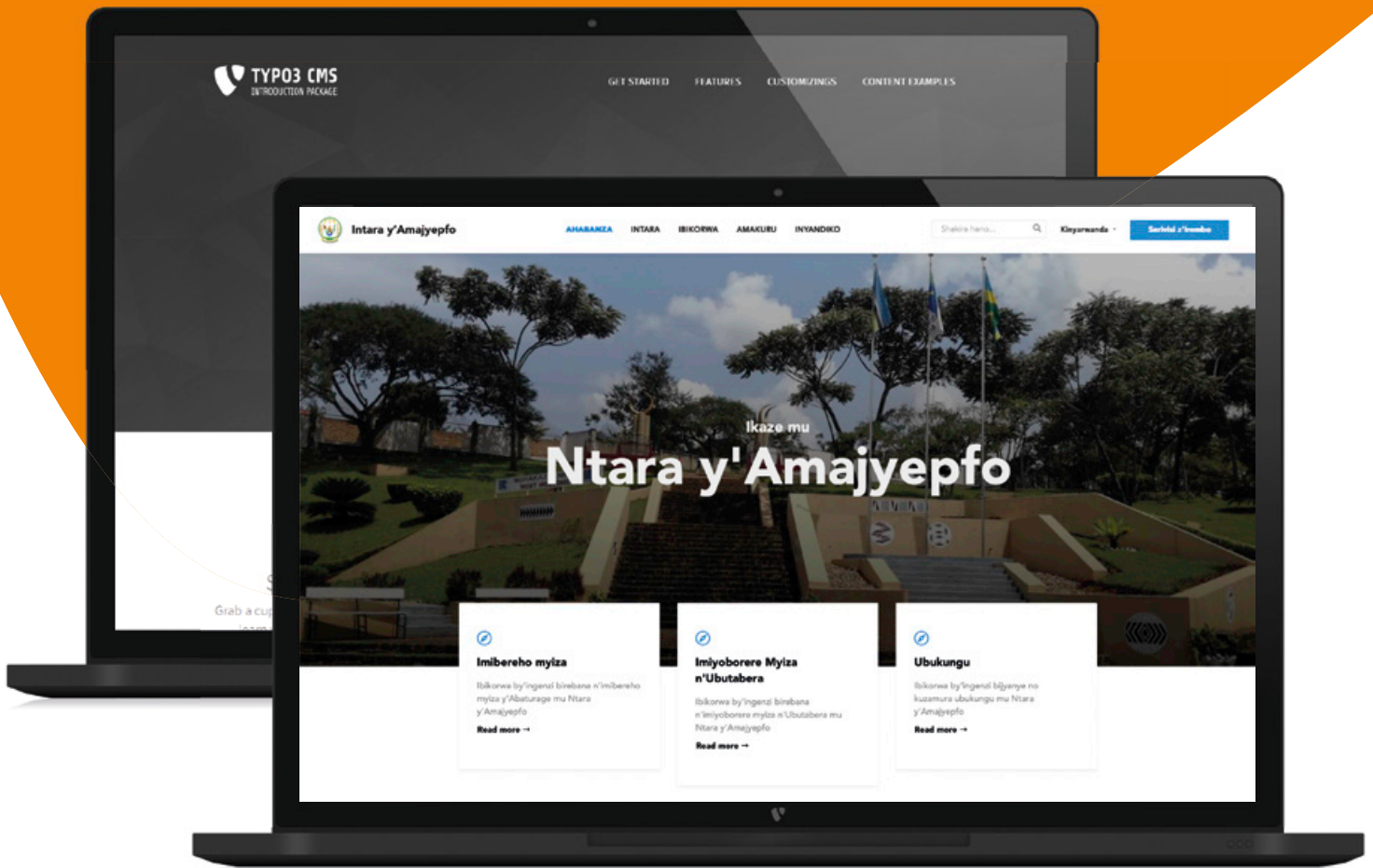
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Open Source Standardization of Government Websites in Rwanda

Using a democratic and not-for-profit open-source project to foster sustainable and independent local business, powered by TYPO3 CMS and supported by the TYPO3 Association.

Key project results

- Strategic choice of secure, performant, cost-efficient, and user-friendly content management software for all government websites and portals in Rwanda.
- Implementation of 250 government and public institution websites using open-source software (TYPO3 CMS).
- Establishment and training of a local skilled workforce, enabling independent local businesses to develop and maintain government websites.
- Creation of a sustainable, non-exploitative local economic cycle, generating business opportunities for local companies and creating new employment perspectives for the young people of Rwanda.
- Fostering of a civil-society community around an open-source project based on democratic practices.



“We were looking for an open-source, multi-tenant enterprise content management solution to build websites for the Government of Rwanda. TYPO3 was a perfect solution for our purpose. Thanks to the support of GIZ and the TYPO3 Association, we could make all this happen.”

Thomas Wiemann, government digitization program manager,
Rwanda Information Society Authority (RISA)

Role of government websites

Maintaining a modern and efficient government web presence is a necessity in today's world.

Government websites are a window into a country, reflecting its identity, culture, and human and economic development. They are also sources of up-to-date information. Digital government web interfaces can provide citizens with easier access to public services and encourage business, investment, and tourism.

Need for standardization

A valuable governmental website is secure, performant, attractive, and user friendly while providing access to relevant government information and services. It should present a cohesive content structure that allows fast information retrieval and effective navigation.

- **Standardized information flow and consistent visual identity** across government web properties build trust, save time, and make navigation easier for website visitors.
- **Consistency and standardization behind the scenes** in the CMS's administrative backend and source code make it easier to maintain the websites, keep them secure, and implement universal accessibility standards.
- **Common governance principles** for web hosting, development, and maintenance processes minimize costs, resource consumption, security risks, and dependency on single service providers.
- **Open-source solutions** reduce reliance on foreign commercial service providers and offer opportunities to invest local or national tax revenue directly in the local or national economy by hiring in-country agencies and training citizens as service providers.

“I believe the model of using standardized enterprise open-source solutions like TYPO3 combined with capacity building for key government institutions is very valuable and could become a blueprint for future endeavors.”

Olaf Seidel, program director during project implementation,
Digital Solutions for Sustainable Development (DSSD), GIZ Rwanda



Rwanda's coherent and proven approach

Since 2019, Rwanda has pioneered a successful model for implementing government websites, based on a cohesive strategy, solid governance, and a parallel program of local technical skill development.

The overall plan encompasses more than 500 official websites. As of December 2022, the program had relaunched the websites of all ministries and more than 250 other government websites.

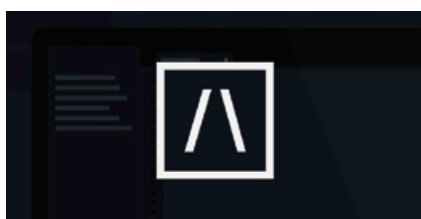
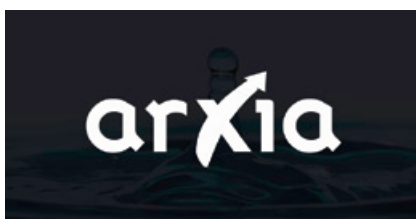
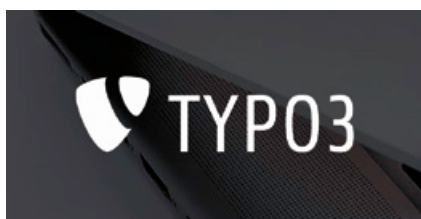
Rwandan professional talent implemented the websites, all based on the same open-source technological platform, TYPO3 CMS. This work provided business opportunities for local software development companies, new local jobs, and positive economic prospects for the country's citizens.

Any country that wants to fast-track the implementation of a standardized, cost-effective, efficient, and secure web presence can now adopt the proven Rwandan platform and development model.

Project participants

The project implemented in Rwanda is the result of collaboration between multiple parties:

- **MINICT**, the Ministry of ICT & Innovation in Rwanda, as well as government agencies, took part in the project implementation.
- **RISA** (Rwanda Information Society Authority) as the implementing agency for the IT projects of the Government of Rwanda. www.risa.rw
- **GIZ**, the German Agency for International Cooperation GmbH (Deutsche Gesellschaft für Internationale Zusammenarbeit GmbH) provided funding, project management, and IT architecture support for the project. www.giz.de/en
- **TYPO3 Association** coordinated and funded on-site expertise and education relating to TYPO3 CMS. www.typo3.org/association
- **Two European software agencies** provided TYPO3 expert instructors for workshops at the request of the TYPO3 Association:
 - **Arxia** (Romania) www.arxia.com
 - **Macopedia** (Poland) www.macopedia.com
- **Rwandan software agency Awesomity Lab** planned, built, and launched the government websites in collaboration with RISA. www.awesomity.rw



Project history

Description

The project started in March 2018, with the establishment of a dialogue between RISA and the TYPO3 Association. Technical workshops supported by the TYPO3 Association followed in June and December 2018. As the project moved into the implementation phase, GIZ supported and funded development, knowledge transfer, and the coaching of web developers, project managers, DevOps engineers, and trainers in Rwanda. The TYPO3 Association and its member agencies continued to offer support throughout the project and the TYPO3 Rwanda User Group launched in February 2020 at a well-attended public event.

The new official website of the Government of Rwanda, gov.rw, was launched on 18 April 2020. The development of new websites and maintenance of live sites and technical infrastructure is an ongoing, continuous effort by RISA and Awesomity Lab.

Timeline

2018–2019

- Preparation and analysis phase, including four trips to Rwanda by TYPO3 Association representatives and two onsite technical TYPO3 workshops:
 - **March 2018:** Daniel Homorodean participated in the CMS Africa Summit in Kigali, where he presented TYPO3 CMS and engaged representatives of the Rwandan Information Society Authority (RISA) for the first time.
 - **December 2018:** A hackathon was organized by GIZ and MINICT to develop a new website user interface (UI). Alina Fleser and Daniel Homorodean went to Kigali for one week to conduct technical workshops with the RISA team, focusing on the technical characteristics of TYPO3 and demonstrating how to install and configure it.
 - **April 2019:** Daniel Homorodean participated in the Transform Africa Summit in Kigali and discussed the prospect of re-implementing all government websites using TYPO3 with the teams of GIZ and RISA.
 - **June 2019:** Anja Leichsenring and Daniel Homorodean went to Kigali to provide technical workshops on using TYPO3 for a larger team from RISA and local web agencies.
 - **September 2019:** RISA and GIZ set up a funded project for the development of the gov.rw website and requested coaching support from experienced TYPO3 agencies. Experts from the agencies Arxia and Macopedia traveled to Kigali to establish a coaching project that ran until May 2020. It supported the local development team in implementing the gov.rw website.

2019–2020

- First implementation phase with direct coaching from TYPO3 agencies.
- Development of the central government portal, [gov.rw](https://www.gov.rw), as a model for the other websites.

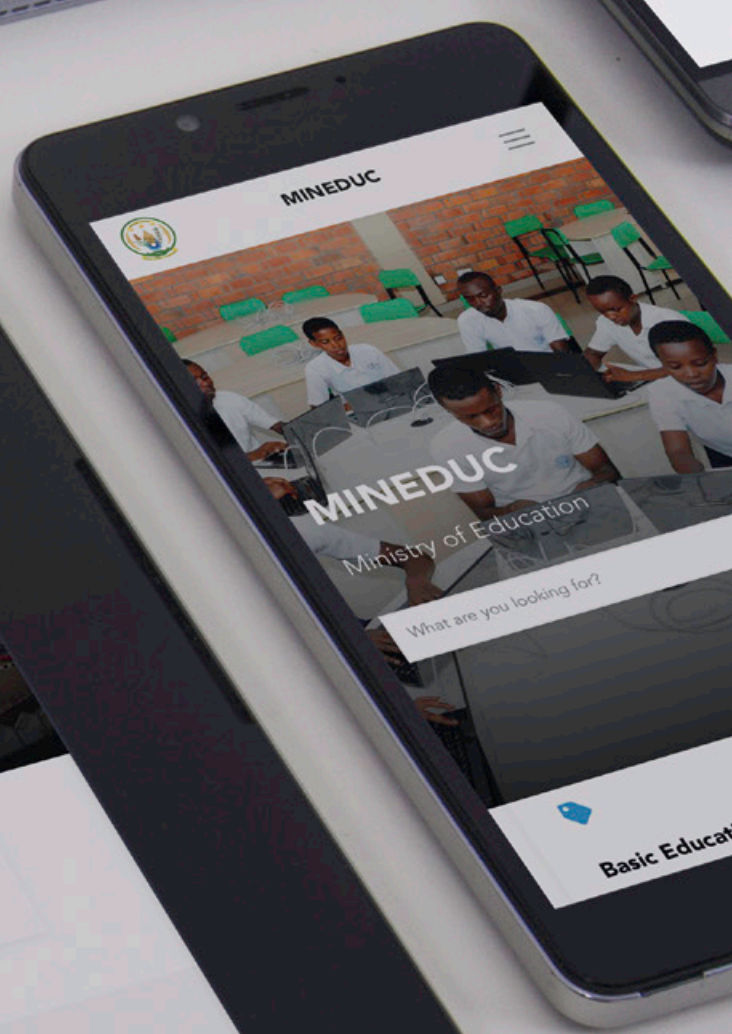
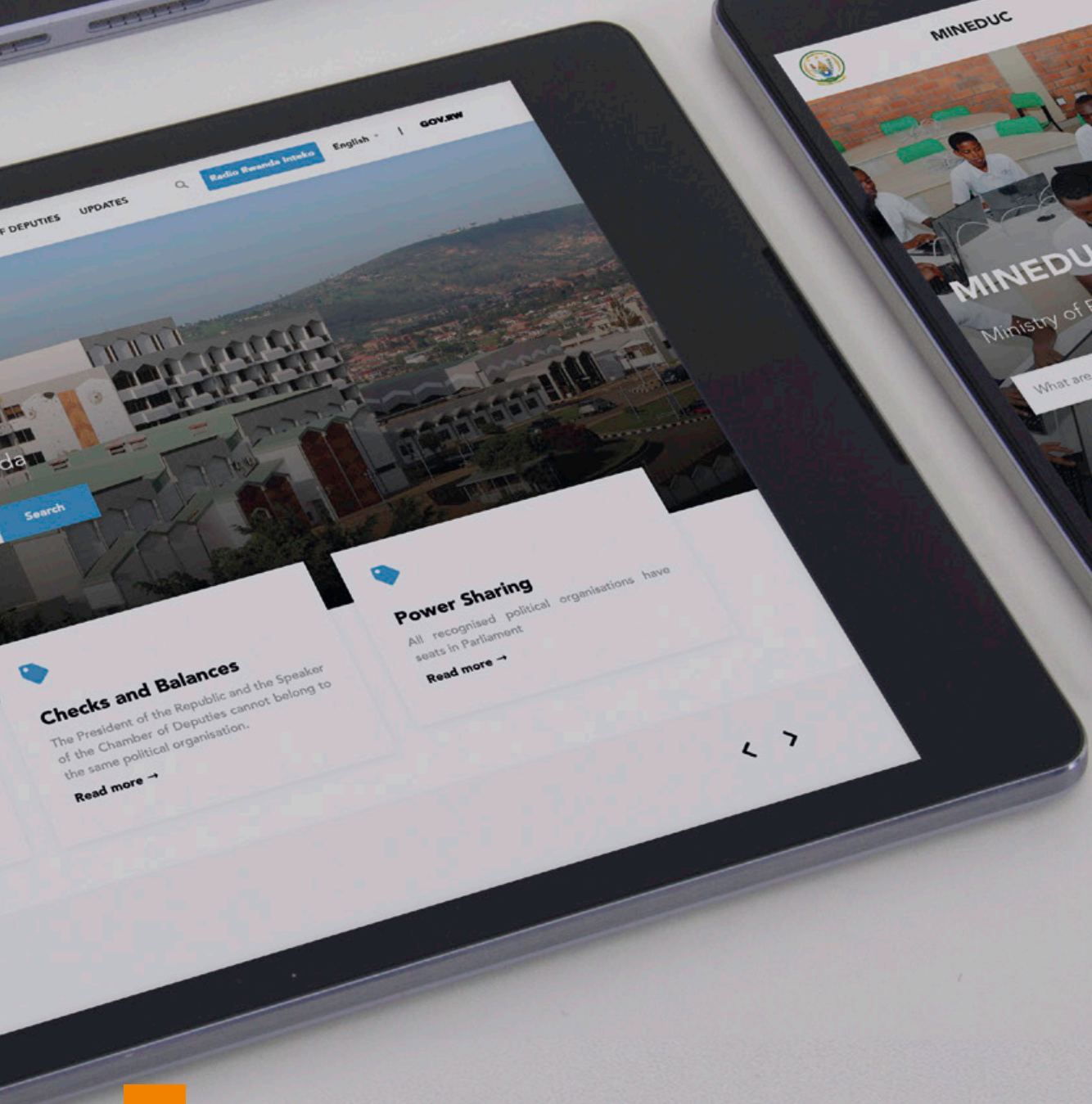
2020

- Continuous implementation, with the upgrading, development, and launch of websites proceeding in parallel:
 - **April 2020:** Main government website launch
 - **October 2020:** All government ministry sites relaunched

2021-2022

- Rwandan web developers relaunch over 250 public institution websites using open-source software (TYPO3 CMS)





Retaining independence with open-source platforms

The websites were implemented using TYPO3 CMS, an open-source content management system developed by a not-for-profit membership organization and its community of web businesses and independent contributors.

About free and open-source software

TYPO3 CMS is released as Free and Open-Source Software under the GNU General Public License (GPL). This popular software license uses regular copyright principles to grant copy-holders the right to freely modify, copy, share, and redistribute the software, as long as new copies are released with a compatible license.

Instead of relying on a single vendor with controlling rights to the product, open-source software is often the result of a collaborative effort within a worldwide community, enabled by universal access and distribution. The community contributes features and bug fixes for the common good and ensures product quality.

The right to distribute is only triggered once the software is made available to others. This control makes it possible to prevent the distribution of sensitive information when necessary.

Wide-ranging benefits of open source

Beyond its direct users, free and open-source software can benefit society at large in many different ways.

Financial independence

Open-source software carries a low initial investment cost. Even though there may be a cost related to initial development and making the software available to the user, the right to redistribute the software means it is made available without paying a (recurring) license cost.

Anyone with access to the software source code can use the software for their own financial gain from day one, drastically reducing the initial investment required to start a business benefiting from the software.

Non-exploitative and anti-colonial

Open-source software is not without cost: IT staff, infrastructure, and system maintenance are still required. However, open-source software gives greater control over where to spend and invest budget, enabling the fostering of non-exploitative and local economies. It reduces or entirely prevents dependencies on foreign businesses and can be maintained without the transfer of money abroad. Local tax revenue can be reinvested into the local economy rather than sent to foreign corporations.

Lowered barriers to knowledge building

Just as open information can make educational material available to more people, open-source software allows IT students to learn by using, inspecting, and changing the software.

Educational institutions can base their management and curriculum on the use of open-source software to lower the cost per student, while giving them access to peer-to-peer knowledge sharing with leading global software experts in the open source community.

Security

Hardening the security of any system is an ongoing process. Many argue that open code and openness to contribution are themselves benefits, because they allow anyone to review and confirm the system's security and contribute fixes without delay. The wide use of TYPO3 CMS in governments, universities, and institutions in Europe and elsewhere means that the software passes extensive scrutiny and expert testing regularly.

On the other hand, closed-source software makes external audits hard to accomplish. A lack of external scrutiny can encourage the diversion of resources from internal quality control to cosmetic outward-facing features.



As with any software project, security is also a question of resources and focus. TYPO3 CMS, for example, has a tradition of taking security very seriously. The **TYPO3 Security Team** is funded by the TYPO3 Association and is responsible for security-related concerns in the entire ecosystem.

Support of civil society

Owing to its reliance on open knowledge exchange and collaboration, open-source software is the basis for numerous national and international, formal and informal civil society organizations. Whether formal (like the TYPO3 Association) or informal, the user groups formed around open-source projects differ from those formed around proprietary software in that they are a part of the consensus-driven decision-making process of the project itself. Any person or group can contribute opinions or direct change to the project.

Democracy-building and peaceful coexistence

A factor often overlooked when describing an open-source project's contribution to civil society is the role such organizations can play in developing democratic structures and practices. Just like a country, an open-source project benefits from inner stability, recognition of the needs of minorities, good governance, broad participation, and consensus-driven decisions. Therefore, a successful open source community is a platform for learning democracy skills and understanding the foundations of peaceful coexistence.

TYPO3 CMS

TYPO3 CMS is widely used, and powers governments and public administration websites, city halls, international organizations, and large corporations. Its state-of-the-art security, performance, and extensibility make it the ideal technical solution for this type of project.

It is well-suited for a multi-tenant software architecture, which enables multiple websites to run on one instance of code, as in the case of the Rwandan government websites. This architecture can drastically reduce the costs of development and maintenance. You can find more information about TYPO3 CMS at typo3.com/typo3-cms.

TYPO3 Association

The TYPO3 Association is a Swiss not-for-profit association founded by members of the TYPO3 Community in November 2004 that provides software to the public free of charge. It has its headquarters in Sissach BL, Switzerland. The TYPO3 Association is non-partisan and denominationally neutral.

The association has approximately 1,000 members and coordinates and funds the long-term development of TYPO3 CMS. It is the owner of the TYPO3 trademark.

Find more information at typo3.org/project/association.

TYPO3 GmbH

In 2016, the TYPO3 Association established TYPO3 GmbH as a fully-owned service company to provide support services and take on the development of the TYPO3 CMS software. The company is headquartered in Düsseldorf, Germany.

TYPO3 GmbH offers commercial services, such as extended support plans, service level agreements, and partnerships to support, extend, and enhance TYPO3 CMS. The company does not compete with TYPO3 agencies and service providers, but rather provides additional supporting services, such as presales services, project reviews, and marketing for the content management system. Find more information at typo3.com/typo3-gmbh.

Reusable four-pillar model

The collaboration model used in Rwanda increases the chance of success by basing itself on four pillars. This is a generic concept that can be reused elsewhere.

Pillar 1: Local platform commitment

Commitment to the technical platform (TYPO3 CMS) by a client with sufficient size created a sustainable demand in the market. Central governments are good examples of such clients in developing and emerging markets.

Pillar 2: Financial capacity

By creating the financial capacity to pay for the development, maintenance, and hosting of the new websites, local web agencies are given the financial and human-resource capacity to support their employees' learning.

Where capacity is scarce, external funding must be found, e.g. from international funding, like that provided by GIZ in Rwanda.

Pillar 3: Local skilled workforce

The presence of a skilled local workforce capable of learning the technical platform and using their acquired knowledge for the benefit of the clients is crucial (see: Pillar 1). The agency employers must be willing to adopt the technical platform as part of their business strategy.

Pillar 4: Technical platform

The technical platform cannot stand in the way of the initiative's local stakeholders. In Rwanda, the TYPO3 Association's backing of the project enabled access to a network of experts who could train the local workforce pro bono. The Association's not-for-profit purpose ensured a local economic cycle where the Rwandan government collaborated with an independent local contractor without financial ties or dependencies outside the country.

Many countries lack a standardized strategic approach to secure, performant, cost-efficient, attractive, and user-friendly websites.

Since 2019, Rwanda has pioneered a successful model for implementing government websites

that is based on a cohesive strategy, solid governance, and a parallel program of local technical skill development.

As of early 2023, 250 Rwandan government websites have been planned, built, and launched using TYPO3 CMS,

an open-source content management system. At least as many more are on the way. The not-for-profit TYPO3 Association has provided on-site expertise and education in collaboration with its professional community.

The Rwandan model:

- Generates business opportunities for local companies.
- Creates new employment perspectives for the young people of Rwanda.
- Kicks off sustainable, non-exploitative local economic cycles.
- Fosters civil-society initiatives around an open-source project based on democratic principles and practices.
- Can be reused elsewhere.

Any country that wants to fast-track the implementation of a standardized, cost-effective, efficient, and secure web presence can now adopt the proven Rwandan platform and development model.

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