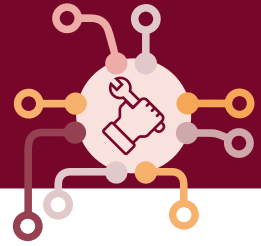# Open source – Development and use of free software

DC requires increasingly sophisticated software systems in its work. Websites or databases that contain technical information, directories of experts, apps and much more need to be developed for projects (→ *app*). Free and open source software (FOSS) (→ *open source*) is an important resource, offering highly sustainable and cost-effective ways of developing these systems. The additional advantages of FOSS include the higher quality and greater reliability and flexibility achieved when other actors further develop and fine-tune the software for similar purposes. FOSS does have its downsides however, so an accurate (context-specific) assessment will need to be carried out before using it. Section 1 explains the basic advantages and disadvantages of FOSS. Sections 2 and 3 contain checklists that support informed decision-making and take local conditions into account.

1. WHAT ARE THE ADVANTAGES AND DISADVANTAGES OF USING FREE AND OPEN-SOURCE SOFTWARE?

The basic advantages and disadvantages of FOSS are outlined below.

	ADVANTAGES	DISADVANTAGES
Cost-efficiency	No licence fees and open standards. Software development projects can start out small, be quickly disseminated and then scaled up to service many users.	Costs may be incurred for consultancy, training, maintenance, support and warranties.

Security and legal aspects	Developers are given extensive rights to reuse and redesign FOSS programs and are entitled to change the general orientation of a FOSS product for their own purposes.	Using FOSS does not automatically imply that the system will be secure. Security problems may arise if maintenance work is not properly carried out.
	The use of open-source code means that programs can be tailored to users' precise needs. As there is no non-disclosure agreement in place for open-source programs, any errors found during security checks can be disclosed. As such, users can be quickly informed when any security issues are detected.	Liability and warranty claims are usually ruled out by FOSS licences, but they can be incorporated in separate contracts with service providers.
		Note that legal uncertainty often (temporarily) surrounds very new FOSS products.
		Furthermore, security holes can also occur where state regulations on data protection or on the use of private data (e.g. in the health care system) are insufficient or absent.

Productivity, innovation and infrastructure	In large FOSS projects, interfaces are usually well defined, open and documented. Therefore existing FOSS components can be efficiently reused and integrated to make new large-scale programs. Many FOSS solutions offer flexible integration.	It is not just the lesser-known, small-scale FOSS solutions that have few or no contact persons available to provide support. FOSS projects generally require a large amount of time and effort from qualified staff.
	FOSS can serve as a basis for new business models and promote or accelerate innovation and thus business potential.	The lack of IT infrastructure and/ or of qualified staff (whether external or internal) to maintain software or to identify/address security issues are just some of the common problems affecting partners in the Global South.
	FOSS can simplify the integration of different →*e-health* solutions by, for example, incorporating →*cloud*-based systems.	Considerable complications can arise when FOSS is connected to other applications, especially commercial software.
	Partners can support the project's design, initial implementation phase, and roll out and training of employees. Internal staff can assume responsibility for long-term maintenance, etc. and be supported in this by contracted FOSS developers.	

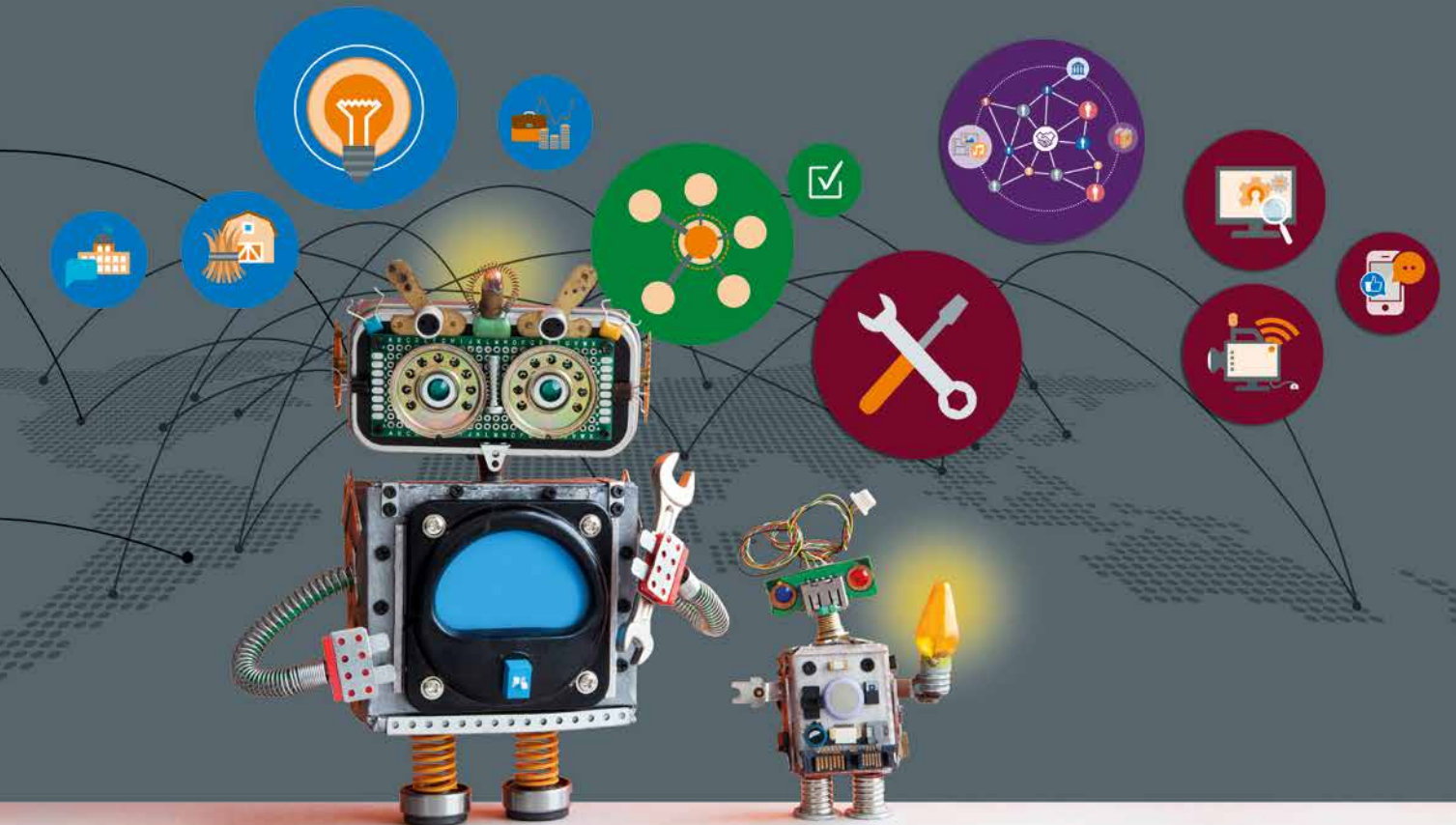|		
Standardisation	Using FOSS often counters the kinds of interoperability-related problems that can arise with proprietary software, e.g. when applying e-health tools in several different health care systems. The adoption of FOSS standards can therefore support the standardisation of e-health.	The maturity levels of different FOSS applications differ significantly. A common criticism is that there is no recognised international or regional institution for testing FOSS products, or defining and reviewing applications and their legal bases (non-disclosure agreements, privacy, etc.) and standardising them across various levels as needed, which could limit the risk of isolated applications, among other things.
Competition	Open standards and free access to source code can reduce dependency on specific developers, cut costs and help to differentiate providers. FOSS allows competitors who want to develop or improve it to do so by using freely available knowledge and technology.	Specific FOSS solutions are often linked via proprietary interfaces to proprietary software, which hinders the adoption of open standards for FOSS. FOSS drivers (or the best ones, at least) are not always available for particular devices.

User recognition	FOSS is recognised for both private and business use.	FOSS products are no harder or easier to operate than proprietary software. However, as users are often more familiar with proprietary software packages, any transition to a FOSS alternative must be well communicated (e.g. through marketing campaigns, training, etc.).

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