Software reuse in Italian public administrations

by Marco Fioretti (http://mfioretti.com)

Software is the engine that makes modern public administrations run and, by implementing their procedures and practices, embodies their culture. For this reason, and to reduce costs, Italy has issued laws and regulations on ownership and reuse of custom software developed for its administrations since the early 1990s. Today, however, while software is much more used, and more mission-critical, in Italian administrations than it was two decades ago, administrations seem to reuse software much less than they could. The reasons for this, the problems it creates and the possible solutions all relate to general relationships and priorities involving software procurement, laws, central government and local administrations. Knowing the history and current status of software reuse in Italy may therefore help everyone who aims to increase the efficiency of public administrations, while reducing costs, through the (re)use of software. We look at these issues starting with a synthesis (Sections 1 and 2) of the relevant laws, government resources and regional initiatives covering software reuse in Italy. Section 3 explains the main problems related to reuse, and Section 4 some possible solutions.

The national landscape

In the last 20 years there have been several national laws and decrees in Italy related to software reuse:

- **1993:** a Legislative Decree, extending Italian copyright law, states that public administrations ("administrations" from now on) are the owners of custom software developed by or for them.
- **2000:** Law n. 340 allows administrations to make available for free, to other administrations which want to use and/or modify it, any software specifically developed by or for them.
- **2002:** Law n. 289 acknowledges software reuse as a cost reduction tool and the need to make applications available inside every administration known to others.
- **2003:** a Directive of the Minister for Innovation mandates that an administration needing software must compare all available solutions, including reuse of custom software already used in other administrations; states that such software must be designed to be portable and reusable; and confirms that it belongs to the administration which first commissioned it.
- **2004:** Law n. 311 rules that administrations must use uniform procedures if they want to use software and services acquired by the state through framework contracts.
- **2005:**
- a Directive of the Minister for Innovation asks administrations to cooperate to find cases in which it is possible and convenient to reuse software.
- A Decree of the President of the Council of Ministers defines how to implement software rationalisation procedures in state-controlled functions, mentioning application service providers as one way to proceed.
- the [Code of Digital Administration](#) (CAD), born as Legislative Decree n. 82 2005/03/07

After 2005, the Code of Digital Administration has been updated several times. Besides, in 2011/2012 an Italian Digital Agenda has been launched, with activities that are still ongoing. However, as far as software reuse is concerned, the relevant milestones remains those listed above.

State-level official organisations and resources covering reuse

The first organisation managing (among other things) software reuse in Italian administrations was the National Centre for ICT in Public Administration (CNIPA), which was established in 2003. In the following years CNIPA created a first [database of reusable applications](#) and published general [reuse guidelines](#) and tools. It also offered initial support and co-financing on specific initiatives. In 2009 CNIPA became [DigitPA](#), which maintains two catalogues – one for [Local](#),[local](#) and one for [Central](#) administrations, that[central](#) administrations – which as of May 2012 contained 26 entries. In June 2012, DigitPA and the Italian Agency for Innovation [have been merged](#) in a new *Agency for Digital Italy,* whose exact tasks and internal structure are still under definition.

DigitPA recognised four types of software reuse, with different degrees of complexity and interdependence among administrations:

- simple transfer;
- reuse of software managed by the administration that owns it;
- reuse with facility management handled by the same administration that provides the software;
- the administration that provides the software acts as an online application service provider for the administration that needs to reuse it: this route is seen as possible and convenient whenever the software functions remain the same in all the administrations that use it.

DigitPA [presents software reuse](#) as *"one of the cardinal principles at the basis of the Italian e-gov development strategy"* and an approach that favours the diffusion of innovative solutions for administrative processes and e-gov services. The corpus of custom applications developed by and for administrations is declared to be:

...a public good of relevant economic and technological value ... a very valuable knowledge base that integrates, represents and preserves the culture and specific know-how of the administrations that produced it.

[Article n. 69](#) of the current CAD states that:

- by default, administrations which own software developed on their specific indications are obliged to provide sources and documentation for free to other administrations *which ask for that software and plan to customise it for their own needs;*
- where possible, tenders must ask that such software is easily portable to other platforms, and demand that its reuse as previously specified must be possible;
- the corresponding contracts *can include clauses jointly written with the software provider* that bind the provider to support reuse in other administrations.

Software reuse initiatives in Italian regions

Italy is divided in twenty regions with [exclusive legislative power](#) on any matters not expressly

reserved by state law, European law and international treaties. Most opportunities for reuse are therefore in areas under regional responsibility. An online search found that 12 regions have publicly visible websites and other formal region-wide projects, or announcements of such initiatives software , for software reuse.

Abruzzo mainly [aims to reuse](#) software listed in the CNIPA/DigitPA catalogues. One of [those products](#), a front-end to find and download forms and information about several procedures, is currently [used by 32 Mmunicipalities](#). Reuse of other [e-gov solutions](#) is currently declared as 15% implemented.

Campania said in 2006 (9) that it was promoting local reuse of software owned by its own administrations, and monitoring their interest in reuse. As of May 2012 the regional [Reuse Catalog](#) lists 11 applications.

Emilia-Romagna in 2007 implemented a network system to develop the ICT systems of all its administrations in one coherent way, with emphasis on reuse, mutual support and knowledge sharing. Its [Reuse Kit](#) bundles software with all the related administrative and technical documentation needed to use it effectively, as well as e-learning resources for end users.

In the same year as Emilia Romagna, also Lazio and Liguria [had plans for their own reuse initiatives](#). Lazio had said that a competence centre to promote and support software reuse, called RIUSOLAZIO, should have been active by March 2008. At the moment the [RIUSOLAZIO website](#) is empty and there is no other recognisable regional portal for reuse. Liguria had announced the constitution of a Reuse Community and Software Catalogue but today, as with Lazio, none of those projects seems currently visible or mentioned anywhere online. Lombardia is in a similar situation. In 2005 it had [announced](#) a joint plan for a new Web portal that would allow all regional administrations to share software applications, informations and best practices. This portal, which should have been [active within a few months](#), is not visible online today.

Marche does not have an official reuse portal, but in 2003 [defined](#) a [framework](#) for reuse of all the software (owned by the region) powering the regional [SUT (Sportello Unico del Territorio, or Unified Territorial Desk)](#): through this system local businesses can, among other things request and obtain authorisations or report their activities as required by law. The framework foresees both simple transfer from administration to administration and region-wide licensing deals managed by the region itself. In 2009 Marche also [made available to the Umbria Rregion](#) its own software systems for management of veterinary and food-related services.

In 2007 Piemonte (9) had decided to reuse the Sigmater Cadaster management software developed by other regions and was transferring its Agriculture Information System to Region Sardegna. Piemonte has an active [Reuse Website](#) and specific [guidelines](#), with contract templates and sample reuse licenses coming soon.

The [section on software reuse](#) of the Sicilian regional website exists, but is practically empty. Toscana has an active [Reuse Regional Competence Centre](#). Its main parts are a catalogue launched in 2008 which features tens of products, and the official regional online community for administrations and software developers interested in reuse.

The [RIVA project](#) offers to all municipalities in Valle d'Aosta an integrated system for online information plus some demographic and tax payment services. RIVA was built reusing the [PEOPLE](#) e-government platform owned by the City of Florence and co-developed with the Emilia-Romagna, Liguria, Marche, Toscana, Umbria and Valle d'Aosta regions. Finally, Region Veneto, in 2003, started to promote reuse through voluntary participation of local administrations in [Agorà del Riuso](#), a virtual marketplace for public servants or private contractors interested in learning about and evaluating reuse. Veneto also produced a guide to design for reuse, reuse analysis and ad-hoc training.

Obstacles to reuse

Both earlier articles and current discussions in the Italian e-gov community (cfr 8,11,12,14 in Bibliography) tend to agree that software reuse in Italian administrations still happens much less than it could. The most relevant factors are presented in the rest of this section.

Norms and laws working against (re)use of free/open source software

Sometimes free/open source software is not given enough importance in single public tenders (5). The very laws listed in Section 1, however, complicate the (re)use of such software.

For instance, the requirement that administrations must own all custom software developed for them can complicate the development of complete custom solutions with standard free/open source software components, whose copyright necessarily belongs to other (often many) independent authors.

The same constraint makes life harder for developers who would like to reuse – openly! – code they have already written for an administration. According to the law, that code belongs to that first administration. What if another administration, which by the same law is entitled to become *the* owner of all the custom applications it commissions, wanted a similar application? Should those developers write new code from scratch, with obvious extra costs? Besides, there is no obligation for administrations which reuse software to make their *own* customisations available for reuse.

Obsolescence is not worth reusing

Software upgrades and, in general, ICT adoption, happen at very different speeds across Italian public administrations. The reasons range from different priorities to different timings and amounts of budget cuts in each organisation. The result, as described in a 2009 report of the Bank of Italy (15), are "sensible difference in ICT adoption" throughout the country.

To see one consequence of this situation, imagine that an administration originally developed some easily reusable software, but later on has no funds to upgrade both that application and the underlying operating system'. Other administrations who did receive funds and were able to upgrade their operating systems would not be able to reuse that application. In fact, reuse of single software applications makes sense only when they don't force an organisation to downgrade its ICT infrastructure, assuming this is even possible.

Tolerance of dual-track procedures

The CAD and most other relevant laws continue either to declare that paperless procedures are *preferred*, i.e. not mandatory, or to avoid any real sanction for managers who fail to implement such procedures in their administrations. One direct consequence of this fact, especially when combined with the other factors explained in the following paragraphs (see for example (8) and (13)), has been fewer occasions, incentives and economies of scale to reuse software.

Local autonomy

While Italy's regions, provinces and towns have great autonomy, many of the services for which they

are directly responsible (especially at the lowest levels) have the same basic constraint and characteristics, because these are defined by national laws.

For example, since January 2011 each Italian town has been required by national law to have its own website with a minimum, predefined set of information and functions. This is probably one of the reasons why the use of open source content management systems by Italy's 8092 towns rose from 15.8% in 2011 to 21.2% in early 2012 (13).

On the other hand, when in May 2012 the Italian Government set up a public website to informally collect feedback and suggestions about the national Digital Agenda, a citizen suggested Let's put an end to the jungle of town websites because, as he says: *"every Italian town has its own Internet website... developed ad-hoc, often on proprietary platforms, and without any implementation standard..."*

In 2005 A. Fuggetta (11) wrote of a regional manager who was not even willing to discuss reuse because regions are autonomous and want to do things by themselves. Professor Vincenzo Ambriola of the Regional Reuse Competence Centre in Toscana confirmed to JOINUP that this attitude is still common today:

> *The main reason [behind slowness of reuse] is that every administration wants to have its specific application, even when the difference from an existing application is small. Secondly, the software producers are very smart. They try to convince administrations that what they are going to do is unique and well suited for them. At this moment we have a lot of the same software written sometimes by the same companies. That situation has been happening for two or three years now.*

Software is frequently and easily reusable only when development can be coordinated centrally (see also (10)), or when regulations do not leave so much room for adaptation that the total cost of ownership becomes comparable to that of code written from scratch. Where software is concerned, therefore, administrative autonomy as practised today in Italy strongly limits the amount of economically sensible reuse.

Bureaucracy

Italy still has complex bureaucratic procedures in fields as different as, to quote just three examples, new businesses (16), promotion of renewable energy (17) and wine quality control (18). Even these complex bureaucratic procedures can block reuse. The more steps and independent (though not really accountable) stakeholders and controllers a procedure has, the harder it is to reuse existing software for it, and to make new custom software easily reusable. This is especially true when intermediate steps remain based on paper documents.

A wrong vision for reuse?

Considered together, the obstacles to software reuse presented above lead to a general question: has software reuse been given the most effective role in the Italian e-gov development strategy?

Even if reuse were officially formalised as "some sort of Open Source-like circle reserved to administrations" (10), that circle is incomplete today, by definition. Current laws oblige administrations to give away their software when requested, but nothing forces the same administrations to seriously search around for reusable software before starting another

development.

That said, an even larger problem (at least in Italy) may be the very concept of explicitly promoting software reuse on the basis that, as [DigitPA says](), it may produce effects like:

- diffusion of innovative solutions for administrative processes and e-government services; and
- significant economies of scale.

If software reuse is (rightly!) not an end in itself, but just a means to achieve these goals, the problems we have described suggest that promoting reuse is not really effective when it is done before organisations have been properly motivated and helped to reach those larger goals.

If, for example, an administration is not obliged to offer some e-gov services completely online, where is the incentive for it to reuse software already developed for the same purpose by other administrations?

Proposals and conclusions

Software reuse by administrations in Italy, or any other country for that matter, may and should be increased, especially if it can help to create real innovation and cost reductions through a combination of the practices described below.

Making life easier for free/open source software and code reuse

In principle, the laws and norms listed in Section 1 acknowledge that software procurement in Italian public administrations must avoid lock-in. Using exclusively free/open source software could simplify reuse by removing restrictions due to proprietary licenses.

In practice, as explained in the previous sections, the current "exclusive ownership" rule works against this. To overcome this limit in Italy, Corradini and Flagella (8) suggest dual-ownership licensing schemes for custom software. This would leave both commissioning administrations and developers free to reuse software as they see fit.

The reuse license of Regione Toscana (10) takes another approach: it restricts reuse to administrations, but tries to maximise co-operative development among them. Such license-based solutions, however, may remain of little utility (see the previous section) if not preceded by changes at other levels.

Open Data and G-Cloud to the rescue

Two of the most popular e-gov related trends of this period, Open Data and G-Cloud, may greatly increase software reuse.

Software exists to manage data. Open Data activists propose that data from public administrations can be downloaded from the Web in ways that (among other things) make automatic analysis as easy as possible. Common formats and software interfaces can also greatly facilitate the digital transfer of data among administrations. To make such data transfer easier, we can imagine that it could become mandatory for all public local databases of the same type to have the same structure, field names, open programming interfaces and so onthis may. This could increase reuse, without killing innovation and market competition, to a much greater extent than earlier initiatives.

At another level, wide adoption of G-Clouds would leave only the fourth reuse model described by DigitPA, but in a much simpler and reuse-friendly format.

Enforcement or promotion of Promoting standard procedures

So far, most of the discourse on software reuse in Italy has actually been about *making it easier to adapt* existing custom software. The first [DigitPA reuse checklist](#) asked: "is software reuse convenient in your case?" Much less attention has been given to another question: if two procedures implementing the same service are so different that software reuse is only possible through code changes, *do those two procedures really need to be so different in the first place?*

If the answer is no, then the administrations should converge on, and reuse, the most efficient *procedure*. This is, in a sense, a direct consequence of the existing laws and regulations.

The [Piemonte guidelines,](#) for example, acknowledge that reuse involves a reciprocal adaptation of the *ways of working* of different administrations. DigitPA had already touched on the same concept in 2007, when it [made co-financing available](#) only to projects that (among other things) favoured convergence towards standard organisational behaviours.

Later analyses performed in Italy (2) confirmed that software reuse is above all a way to share better ways to do the same things, that is to transfer *organisational* innovation. Finally, [Dr. Maria Pia Giovannini of DigitPA](#) told JOINUP earlier this year

:

"Another opportunity for reuse is to create a standardisation solution in public administration, especially in local government where the functionalities are the same. Often, if you have a different solution, you don't have good services for the end users. This is because each local government offers to the citizen different services for the same thing. For example, there are different procedures for obtaining the same certificates in various cities or regions. But if you use the same software, you have the opportunity to create the same solution for all citizens. The same or equal quality of service can also be obtained through software reuse."

Together with the problems described in the previous section, the statements above seem to confirm that the most effective way to increase software reuse may be to forget software and work on bureaucratic regulations, procedures and data structures instead.

Before we concern ourselves with applications, it is *those* objects that should be made really "reusable", that is as simple and standardised as possible throughout the whole country. Before, that is, they even become software.

Of course, making this happen requires concrete actions from the central and regional governments of Italy, including ad-hoc training and real incentives and sanctions for managers of the administrations.

Conclusion: the first thing needed is a complete software census

The actions described in the previous paragraphs are necessary to foster real innovation, cost savings and software reuse among Italian administrations. As far as software adoption is concerned, the first step to achieve these goals in the quickest and most effective way is the one that F. Marzano suggested back in 2010 (12): the enforcement of [art 68/2-bis of the CAD](#), which says (but is largely ignored, see (12)):

Public administrations promptly notify to DigitPA the computer applications and technology and organisational practices that they adopt, providing every useful information... also to favour reuse and the widest possible diffusion of best practices.

In other words, we need as soon as possible a complete census of all the software used in Italian administrations. Such information would make it much easier to discover what can be reused, at all levels. Luckily, current technologies make such a census easy, quick and cheap to set up. All that is needed is:

- one simple database fronted by a standard Web form on which administration representatives could enter the applications they use; and
- a government decree setting out sanctions for the managers of those administrations that do not submit their census forms promptly and completely.

References

1. Norms about reuse (Regione Piemonte)
2. The dynamics of diffusion of the practice of software reuse by P. Spagnoletti, 2010
3. Obligation to concede software for reuse: norms overview, G. Craia
4. Reusable Software in Administrations: the reuse portal,M. E. Mansullo, 2008
5. Case Study, Fair Procurement Free/Open Source Software in Italy JoinUp, 2010
6. Reuse National Initiatives (Regione Toscana)
7. Reuse Regional Initiatives (Regione Toscana)
8. The Open Source paradigm in the context of the current software reuse model in the italian Administration, A. Corradini, T. Flagella, 2008
9. 4th Report on Innovation in the Italian Regions, 2006
10. A regional experiment to govern reuse in local public bodies by V. Ambriola & Giovanni A. Cignoni, 2010
11. Alfonso Fuggetta on software reuse (2005)
12. CAD reform, software reuse and Open Source Software (Riforma del CAD, Riuso e Open Source, F. Marzano, 2010
13. Open Source Diffusion in the Websites of Italian Cities, G. Destefanis, R. Tonelli, G. Concas, M. Marchesi, 2012

14. Facciamo Davvero Riuso (Shall we really practice reuse?) Online discussion about proposals for the Italian Digital Agenda, April 2012

15. *Informazione negli Enti Territoriali*, (ICT adoption in local organizations) Bank of Italy, 2009

16. *Vita dura per le imprese italiane: la burocrazia costa 10 miliardi*,*(Life is hard for Italian companies: bureaucracy costs them 10 billion Euros) January 2012*

17. *Incentivi rinnovabili, in Italia troppo complicati. L'Ue boccia il decreto* *(Incentives for renewable energy too complicated in Italy. The EU rejects the decree), June 2012*

18. *BUROCRAZIA, TIRANNOSAURO DEL NOSTRO TEMPO* *(Bureaucracy, the tyrannosaurus of our time), February 2012*