

2013

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### Bluebook Citation

Marco Fioretti, *Catholic Social Doctrine and the "Openness" Revolution: Natural Travel Companions?*, 10 U. St. Thomas L.J. 714 (2013).

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## ARTICLE

# CATHOLIC SOCIAL DOCTRINE AND THE “OPENNESS” REVOLUTION: NATURAL TRAVEL COMPANIONS?

BY: MARCO FIORETTI\*

## INTRODUCTION

Catholic Social Doctrine (“CSD”) offers guidelines for the development and management of society inspired by the Gospel.

“Openness” is the collective name given in this paper to a specific set of attitudes, technologies, concrete practices, and legal infrastructures, all driven by principles that include a “share-and-share alike” approach to ownership and reuse of goods, and massive usage of the Internet for affordable, large-scale collaborative design and mutual support. Such characteristics make Openness particularly well suited to address (among other things) the “real needs” of many people, as defined later in the paper.

Thanks to software and the Internet, many spontaneous communities worldwide, whose common characteristic is Openness, have already developed collaborative goods, services, and ways of working that, for all the reasons above, may be relevant in CSD.

The first two sections of this paper present CSD’s main points and, respectively, the real nature of software and its effects on modern society. The third section gives a general definition of Openness, followed by short explanations and practical examples of some of its main applications. The fourth and final section explores the many links between CSD and Openness and the possible synergies and actions that may result from them.

### I. A SHORT, AD HOC SUMMARY OF CATHOLIC SOCIAL DOCTRINE

#### A. *Goal, Scope and Key Principles*

As far as we are concerned, society may be defined as the set of principles and structures through which people see and organize themselves at the

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civil (non-governmental organizations or “NGOs”), economic (exchange of goods and services), and political (laws and role of the State) levels.<sup>1</sup>

Based on the Ten Commandments, the Gospel, human wisdom, and science, CSD is “a single teaching, consistent and at the same time ever new,”<sup>2</sup> about development and management of society. Therefore, CSD only defines general principles: “The Church has no models to present; models that are real and truly effective can only arise within the framework of different historical situations . . . [CSD is just] an indispensable and ideal orientation.”<sup>3</sup>

In order to highlight their connections with the rest of the paper, some of the fundamental principles of CSD are briefly summarized in the next paragraphs. Other relevant, recurring themes, like the ownership of means of production, are also mentioned throughout the paper.

### 1. *Human Dignity, Development, and Real Needs*

In CSD, the dignity and development of the human person are always at the center: society must serve all the individual persons within it, not the other way around. The human development that CSD proposes is an integral answer to the real needs of each person. “[I]f it does not involve the whole man and every man, it is not true development.”<sup>4</sup> Therefore, such development is achievable only by combining many material and immaterial contributions, from food and shelter to education, equal opportunities, and more. Besides, human development is primarily a vocation, not something that institutions can entirely provide from the outside: true human development begins with a personal free choice and assumption of responsibility.<sup>5</sup>

The concept of true human development is strictly and constantly connected throughout the whole history of CSD (if not of all Catholicism) with the one of “real needs:” “the State’s intervention in the economic environment must be neither invasive nor absent, but commensurate with society’s real needs.”<sup>6</sup> Pope Benedict XVI says that “[t]he more we strive to secure a

1. See *An Introduction to Catholic Social Teaching*, SECOND SPRING, <http://www.secondspring.co.uk/course/termtwo.htm> (last visited Oct. 6, 2013) (discussing the distinction between civil, economic, and political levels).

2. Pope Benedict XVI, *Caritas in Veritate* [Encyclical Letter on Charity in Truth] ¶ 12 (2009), available at [http://www.vatican.va/holy\\_father/benedict\\_xvi/encyclicals/documents/hf\\_ben-xvi\\_enc\\_20090629\\_caritas-in-veritate\\_en.html#\\_edn20](http://www.vatican.va/holy_father/benedict_xvi/encyclicals/documents/hf_ben-xvi_enc_20090629_caritas-in-veritate_en.html#_edn20).

3. Pope John Paul II, *Centesimus Annus* [Encyclical Letter on the Hundredth Anniversary of *Rerum Novarum*] ¶ 43 (1991), available at [http://www.vatican.va/holy\\_father/john\\_paul\\_ii/encyclicals/documents/hf\\_jp-ii\\_enc\\_01051991\\_centesimus-annus\\_en.html](http://www.vatican.va/holy_father/john_paul_ii/encyclicals/documents/hf_jp-ii_enc_01051991_centesimus-annus_en.html).

4. Pope Benedict XVI, *supra* note 2, ¶ 18.

5. *Id.* ¶¶ 16–17.

6. Pontifical Council for Justice and Peace, *Compendium of the Social Doctrine of the Church* [Encyclical Letter to Pope John Paul II] ¶ 351 (2006), available at [http://www.vatican.va/roman\\_curia/pontifical\\_councils/justpeace/documents/rc\\_pc\\_justpeace\\_doc\\_20060526\\_compendio-dott-soc\\_en.html](http://www.vatican.va/roman_curia/pontifical_councils/justpeace/documents/rc_pc_justpeace_doc_20060526_compendio-dott-soc_en.html).

common good corresponding to the real needs of our neighbours, the more effectively we love them.”<sup>7</sup>

What are the “real needs” that CSD cares about? It is certainly not up to me to give a complete answer to such a high, crucial question. As far as this paper is concerned, however, my understanding of the concept is that “real needs” are those that are a more or less direct consequence and expression of human rights.<sup>8</sup> Needs that, instead, are mere, more or less forced, consequences of external pressures like consumerism, peer pressure, cultural colonization, and/or bad planning and management of common infrastructures should generally not be listed into the “real needs” category: having to own and daily drive a car, for example, only because there is no public transportation in one’s city would not be a real need.

## 2. *Common Good*

Common good is defined as the sum total of social conditions that enable human development<sup>9</sup> “on the basis of a balanced hierarchy of values”<sup>10</sup> that maximizes the possibility of what would be authentically good for groups or single persons (“real needs,” again), both in the short and in the long term.

## 3. *Participation*

In CSD, participation is active contribution to the common good from each individual: something that is necessary because it enhances society, and because everyone has something to contribute.

## 4. *Solidarity*

Human beings are social by nature (which, incidentally, is just what the Web 2.0 meme is all about),<sup>11</sup> but their true unity in society must come from free acceptance of the commandment of Jesus Christ to love one’s neighbor. Consequently, while solidarity implies social charity and mutual

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7. Pope Benedict XVI, *supra* note 2, ¶ 7.

8. An incomplete list of such rights may include, in no particular order: food, shelter, education, healthcare, local cultural heritage, sustainable development, and freedom of religion and speech.

9. See Pope John XXIII, *Pacem in Terris* [Encyclical Letter on Peace on Earth] ¶ 58 (1963), available at [http://www.vatican.va/holy\\_father/john\\_xxiii/encyclicals/documents/hf\\_j-xx-iii\\_enc\\_11041963\\_pacem\\_en.html](http://www.vatican.va/holy_father/john_xxiii/encyclicals/documents/hf_j-xx-iii_enc_11041963_pacem_en.html).

10. Pope John Paul II, *supra* note 3, ¶ 47.

11. “Web 2.0” is a generic term used to indicate a second generation of the World Wide Web heavily based on social networking and empowering as many Internet users as possible to be active participants and content producers, rather than passive consumers. “Architecture of participation” is listed as one of the core principles in the “Web 2.0 meme map” published by Tim O’Reilly in 2005. See Tim O’Reilly, *What is Web 2.0: Design Patterns and Business Models for the Next Generation of Software*, O’REILLY, <http://oreilly.com/web2/archive/what-is-web-20.html> (last visited Nov. 20, 2013).

support, in CSD it is never a demand for a Welfare State. Its goal is that human persons are not made dependent on the rest of society.<sup>12</sup>

### 5. *Subsidiarity*

Placing Man at the center implies subsidiarity—that is devolution of effective power to “the lowest and most local level compatible with the common good” (which sometimes demands “that decisions which affect many people are sometimes taken at a higher level”).<sup>13</sup> Only in this way can each single human being, or association of human beings, practice as much freedom and responsibility as possible. This is perfectly in line with the will to avoid some “all-encompassing Welfare State.” Simplifying a lot, subsidiarity is not mere consultation (“Do you like this law proposal?”) but genuine participation (“Shall we write this proposal together?”).<sup>14</sup> In order to respect both subsidiarity and solidarity principles, “the State’s intervention in the economic environment must be neither invasive nor absent, but commensurate with society’s real needs.”<sup>15</sup>

### 6. *A Short Note on CSD and Intellectual Property*

A complete definition and discussion of intellectual property would be way beyond the scope of this paper. At the same time, since many parts of Openness directly and strongly depend on alternative applications (or strong critiques) of this concept, it is mandatory to provide a minimum of definitions and background.

The World Trade Organization defines intellectual property rights as “the rights given to persons over the creations of their minds.”<sup>16</sup> These rights are managed through legal structures as copyright, patents, and trademarks. The World Intellectual Property Organization (“WIPO”), in turn, lists as such creations “inventions, literary and artistic works, and symbols, names, images, and designs used in commerce.”<sup>17</sup> Chapter 1 of the official WIPO handbook states that countries have laws to protect intellectual property for two main reasons:

One is to give statutory expression to the moral and economic rights of creators in their creations and the rights of the public in access to those creations. The second is to promote, as a deliberate act of Government policy, creativity and the dissemination

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12. See Pope Benedict XVI, *supra* note 2, ¶ 58.

13. *An Introduction to Catholic Social Teaching*, *supra* note 1, ¶ 38.

14. See Peter J. Henriot, *Catholic Social Teaching and Poverty Eradication: Key Concepts and Issues*, SOUTHERN AFRICAN REGIONAL POVERTY NETWORK, [www.sarpn.org/Country-PovertyPapers/Zambia/Catholic/page3.php](http://www.sarpn.org/Country-PovertyPapers/Zambia/Catholic/page3.php) (last visited Oct. 27, 2013).

15. Pontifical Council for Justice and Peace, *supra* note 6, ¶ 351.

16. *What are Intellectual Property Rights?*, WORLD TRADE ORGANIZATION, [www.wto.org/english/tratop\\_e/trips\\_e/intel1\\_e.htm](http://www.wto.org/english/tratop_e/trips_e/intel1_e.htm) (last visited Oct. 11, 2013).

17. *What is Intellectual Property?*, WORLD INTELLECTUAL PROPERTY ORGANIZATION, [www.wipo.int/about-ip/en/](http://www.wipo.int/about-ip/en/) (last visited Oct. 11, 2013).

and application of its results and to encourage fair trading which would contribute to economic and social development.<sup>18</sup>

Advocates of intellectual property define it as “critical in a world economy that is increasingly dependent on innovation.”<sup>19</sup> Many organizations and scholars worldwide, instead, strongly criticize the current regime of intellectual property for several reasons, including, but not limited to:

1. outright rejection of the very idea that intellectual property exists, or should exist at all;<sup>20</sup>
2. the continuous restriction of public domain caused by ever increasing copyright extensions;<sup>21</sup> and
3. patents seen as obstacles to real innovation, especially in fields like software.<sup>22</sup>

As far as CSD is concerned, apart from the statements in “Caritas in Veritate” discussed in later paragraphs, the Catholic Church has not, until very recently, said much about intellectual property in one sense or another. The Holy See is a member of the WTO and a signatory of the Berne Convention for the Protection of Literary and Artistic Works, as well as of other treaties and conventions in the same field.<sup>23</sup> The Vatican City State adopts, under certain conditions, the Italian Copyright Law.<sup>24</sup> In his intervention to a WIPO meeting in September 2010, that is one year after “Caritas in Veritate,” H.E. Archbishop Silvano M. Tomasi said, “[a]ccording to article 27 of the Universal Declaration of Human Rights, ‘[e]veryone has the right to the protection of the moral and material interests resulting from any scientific, literary or artistic production of which he is the author.’”<sup>25</sup> However,

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18. *The Concept of Intellectual Property*, WORLD INTELLECTUAL PROPERTY ORGANIZATION, [www.wipo.int/export/sites/www/about-ip/en/iprm/pdf/ch1.pdf](http://www.wipo.int/export/sites/www/about-ip/en/iprm/pdf/ch1.pdf) (last visited Oct. 11, 2013).

19. *Why is Intellectual Property Important?*, EDUCATION IP STREET, <http://education.ipstreet.com/home/overview/why-is-intellectual-property-important/> (last visited Oct. 11, 2013).

20. *See, e.g.*, BRIAN MARTIN, INFORMATION LIBERATION 29–56 (1998). For other popular presentations of the same general position, see Richard M. Stallman, *Did You Say “Intellectual Property”? It’s a Seductive Mirage*, GNU OPERATING SYSTEM, [www.gnu.org/philosophy/not-ipr.html](http://www.gnu.org/philosophy/not-ipr.html) (last visited Oct. 23, 2013) and Rick Falkvinge, *Language Matters: We Can Keep Our Liberties*, TORRENTFREAK, <http://torrentfreak.com/language-matters-framing-the-copyright-monopoly-so-we-can-keep-our-liberties-130714/> (last visited Oct. 23, 2013).

21. *See* Lawrence Lessig, *The Public Domain*, FOREIGN POLICY, [http://www.foreignpolicy.com/articles/2005/08/30/the\\_public\\_domain](http://www.foreignpolicy.com/articles/2005/08/30/the_public_domain) (last visited Oct. 23, 2013); *The Incredible Shrinking Public Domain*, CENTER FOR THE STUDY OF PUBLIC DOMAIN, <http://web.law.duke.edu/cspd/publicdomainday/2012/shrinking> (last visited Oct. 11, 2013).

22. *See Patents*, ELECTRONIC FRONTIER FOUNDATION, [www.eff.org/patent](http://www.eff.org/patent) (last visited Oct. 11, 2013).

23. *See Background Information Note on the Legal Framework for Intellectual Property of the Holy See*, WORLD INTELLECTUAL PROPERTY ORGANIZATION, [www.wipo.int/wipolex/en/outline/va.html](http://www.wipo.int/wipolex/en/outline/va.html) (last visited Oct. 11, 2013).

24. *See* Antonella Barbieri & Dario Morelli, *Copyright and the Vatican*, THE GLOBAL LEGAL POST (June 27, 2013), [www.globallegalpost.com/global-view/copyright-and-the-vatican-41065795/](http://www.globallegalpost.com/global-view/copyright-and-the-vatican-41065795/) (discussing the problem of which copyright law applies to the Vatican City State).

25. H.E. Archbishop Silvano M. Tomasi, Statement at the 48th Series of Meetings of the World Intellectual Property Organization’s General Assemblies (Sept. 21, 2010) available at <http://nunzio-un.blogspot.it/2010/10/statement-by-h.html>.

in the same statement he also pointed out that “[w]hile strengthening intellectual property rights has potential for enhancing growth and development in the proper circumstances, it might also raise difficult economic and social costs.”<sup>26</sup>

### B. CSD in the Encyclicals Before 2009

Modern CSD started in 1891 with the “*Rerum Novarum*” letter by Pope Leo XIII. In it we find, among many other things, the assertion that private ownership, while necessary, brings to an owner the duty to be a “steward of God’s providence, for the benefit of others,”<sup>27</sup> that must make property fruitful and communicate its benefits to others.<sup>28</sup> It seems obvious to me that the same approach described in this statement (and in the one by Pope Paul VI in the next paragraph) should be extended to intellectual property. Indeed, the already cited statement by H.E. Archbishop Tomasi to the WIPO meeting in 2010 starts by noting that “[t]he *raison d’être* of the protection system of intellectual property is the promotion of literary, scientific or artistic production and, generally, of inventive activity for the sake of the ‘common good.’”<sup>29</sup>

In 1967, Pope Paul VI confirmed in “*Populorum Progressio*” that all people are called to fulfillment and to a sharing in the good things of the Earth and all other considerations in economics must be subordinated to this principle.<sup>30</sup> Pope Benedict XVI later noted that, in the same letter, Paul VI also called real development “the new name for peace,” insisting that it must be based on “responsible freedom of the individual and of peoples.”<sup>31</sup>

The “*Laborem Exercens*” letter by Pope John Paul II (1981) includes an acknowledgment of special significance to proposals for “joint ownership of the means of work, sharing by the workers in the management and/or profits of businesses, so-called shareholding by labor, etc.” on the grounds that in the Church’s teaching, “ownership has never been understood in a way that could constitute grounds for social conflict in labour.”<sup>32</sup> John Paul II also noted that the proper position of labor and the worker in

26. *Id.*

27. Pope Leo XIII, *Rerum Novarum* [Encyclical Letter on the Rights and Duties of Capital and Labor] ¶ 22 (1891), available at [http://www.vatican.va/holy\\_father/leo\\_xiii/encyclicals/documents/hf\\_l-xiii\\_enc\\_15051891\\_rerum-novarum\\_en.html](http://www.vatican.va/holy_father/leo_xiii/encyclicals/documents/hf_l-xiii_enc_15051891_rerum-novarum_en.html).

28. See *Catechism of the Catholic Church*, ¶ 2404, available at [www.vatican.va/archive/ccc\\_css/archive/catechism/p3s2c2a7.htm](http://www.vatican.va/archive/ccc_css/archive/catechism/p3s2c2a7.htm) (last visited Oct. 12, 2013) (explaining the Seventh Commandment as it relates to the universal destination and the private ownership of goods).

29. H.E. Archbishop Silvano M. Tomasi, *supra* note 25.

30. See Pope Paul VI, *Populorum Progressio* [Encyclical on the Development of People], ¶ 22, available at [http://www.vatican.va/holy\\_father/paul\\_vi/encyclicals/documents/hf\\_p-vi\\_enc\\_26031967\\_populorum\\_en.html](http://www.vatican.va/holy_father/paul_vi/encyclicals/documents/hf_p-vi_enc_26031967_populorum_en.html).

31. Pope Benedict XVI, *supra* note 2, ¶¶ 11, 17, 18.

32. Pope John Paul II, *Laborem Exercens* [Encyclical on Human Work] ¶ 14 (1981), available at [http://www.vatican.va/holy\\_father/john\\_paul\\_ii/encyclicals/documents/hf\\_jp-ii\\_enc\\_14091981\\_laborem-exercens\\_en.html](http://www.vatican.va/holy_father/john_paul_ii/encyclicals/documents/hf_jp-ii_enc_14091981_laborem-exercens_en.html).

the production process demands various adaptations in the sphere of the right to ownership of the means of production.<sup>33</sup> This “adaptation” is defined as socializing property, which is what happens “when on the basis of his work each person is fully entitled to consider himself a part-owner of the great workbench at which he is working with every one else.”<sup>34</sup>

John Paul II went back on this topic in “Centesimus Annus” in 1991, proposing “a society of free work, of enterprise and of participation,”<sup>35</sup> in which “[o]wnership of the means of production, whether in industry or agriculture, is just and legitimate if it serves useful work. It becomes illegitimate, however, when it is not utilized or when it serves to impede the work of others.”<sup>36</sup>

In 1987, with “*Sollicitudo Rei Socialis*,” John Paul II had also committed the Church to “the option or love of preference for the poor”<sup>37</sup> and, among other things, called for a reform of technology transfer:

The motivating concern for the poor . . . must be translated at all levels into concrete actions . . . . In this respect I wish to mention specifically . . . the question of technological exchanges and their proper use . . . . Forms of technology and their transfer constitute today one of the major problems of international exchange and of the grave damage deriving therefrom. There are quite frequent cases of developing countries being denied needed forms of technology or sent useless ones.<sup>38</sup>

### C. “*Caritas in Veritate*”

The “*Caritas in Veritate*” (“*CiV*”) letter of 2009 by Pope Benedict XVI confirms and continues the same teaching started with “*Rerum Novarum*.”<sup>39</sup> At the same time, its language and the specific topics it covers grant *CiV* a special place in this paper. To begin with, *CiV* is the first encyclical to explicitly mention the abuses of intellectual property: “On the part of rich countries there is excessive zeal for protecting knowledge through an unduly rigid assertion of the right to intellectual property, especially in the field of health care.”<sup>40</sup> Benedict also writes that it is not right to export universal goods like labor and technical knowledge “merely for the sake of obtaining advantageous conditions, or worse, for purposes of exploitation without making a real contribution to local society by helping to

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33. *See id.*

34. *Id.*

35. Pope John Paul II, *supra* note 3, ¶ 35.

36. *Id.* ¶ 43.

37. Pope John Paul II, *Sollicitudo Rei Socialis* [*Encyclical Letter for the Twentieth Anniversary of Populorum Progressio*] ¶ 42 (1987), available at [http://www.vatican.va/holy\\_father/john\\_paul\\_ii/encyclicals/documents/hf\\_jpii\\_enc\\_30121987\\_sollicitudo-rei-socialis\\_en.html](http://www.vatican.va/holy_father/john_paul_ii/encyclicals/documents/hf_jpii_enc_30121987_sollicitudo-rei-socialis_en.html).

38. *Id.* ¶ 43.

39. Pope Benedict XVI, *supra* note 2, ¶ 12.

40. *Id.* ¶ 22.

bring about a robust productive and social system, an essential factor for stable development.”<sup>41</sup>

### *1. Gift and Cooperation Are Good (Also) for the Economy*

In CiV, Benedict makes a very strong point that not just man (for his own true development) and society, but the economy itself, needs to acknowledge the importance of free gift: “The human being is made for gift . . . social and political development, if it is to be authentically human, needs to make room for the principle of gratuitousness as an expression of fraternity.”<sup>42</sup>

The reason, says Benedict, is that an exclusively binary model of market-plus-State may not offer any more practical direction for the future and may be corrosive of society.<sup>43</sup> Without internal forms of solidarity and mutual trust, the market may simply be unable to work properly: “[t]he very plurality of institutional forms of business gives rise to a market which is not only more civilized but also more competitive.”<sup>44</sup>

Consequently, the principle of gratuitousness and the logic of gift as an expression of fraternity should find their place within normal economic activity.<sup>45</sup> Giving more space, in a world context, to “forms of economic activity marked by quotas of gratuitousness and communion” is also required in order to defeat underdevelopment.<sup>46</sup>

### *2. Education, International Cooperation, and Cultural Interaction*

In CiV, Benedict explicitly asks that aid programs increase participation and completion from the grass roots, and that solidarity is practiced at the international level especially by promoting greater access to education.<sup>47</sup>

At the same time, CiV warns against both cultural eclecticism (viewing all cultures as substantially equivalent and interchangeable) and cultural leveling; more specifically, both attitudes are seen as a consequence of separation of culture from human nature that can result in new risks of enslavement and manipulation for humanity.<sup>48</sup>

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41. *Id.* ¶ 40.

42. *Id.* ¶ 34.

43. *See id.* ¶ 39.

44. *Id.* ¶¶ 35, 39, 46.

45. *See* Pope Benedict XVI, *Caritas in Veritate* [Encyclical Letter on Charity in Truth] ¶ 36 (2009), available at [http://www.vatican.va/holy\\_father/benedict\\_xvi/encyclicals/documents/hf\\_ben-xvi\\_enc\\_20090629\\_caritas-in-veritate\\_en.html#\\_edn20](http://www.vatican.va/holy_father/benedict_xvi/encyclicals/documents/hf_ben-xvi_enc_20090629_caritas-in-veritate_en.html#_edn20).

46. *Id.* ¶ 39.

47. *See id.* ¶¶ 58, 61.

48. *See id.* ¶ 26.

### 3. *Globalization*

Globalization, says Benedict, reinforces what the Church's social doctrine has always sustained,<sup>49</sup> starting from subsidiarity, which is "particularly well-suited to managing globalization and directing it towards authentic human development."<sup>50</sup> Therefore, a greater degree of international ordering, marked by subsidiarity, is needed.<sup>51</sup>

### 4. *The Institutional Path*

Economic activity can't just happen by itself. It needs both just laws and forms of redistribution governed by politics.<sup>52</sup> In CiV, Benedict points out that every Christian is called to practice charity also in this way, that is availing him or herself of the institutions that give structure to the life of society, as taught by CSD. This is the institutional or political path of charity, "no less excellent and effective than the kind of charity which encounters the neighbour directly."<sup>53</sup> In practice, says CiV, when it comes to charity every country should guarantee, without prejudice to more traditional activities, suitable juridical and fiscal support and structures also to enterprise models that do not exclude profit, but instead consider it a means for achieving human and social ends.<sup>54</sup> Even the focus of international aid should be on consolidating constitutional, juridical, and administrative systems to achieve the same goals.<sup>55</sup>

### 5. *New Forms of Engagement*

Globalization limits the sovereignty of each State. This fact invites a prudent review and remodeling of the role and powers of public authorities "so as to enable them, perhaps through new forms of engagement, to address the challenges of today's world."<sup>56</sup> This may increase new forms of political participation, nationally and internationally, as well as in citizens' interest and participation in public affairs.<sup>57</sup>

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49. *See id.* ¶ 39.

50. *Id.* ¶ 57.

51. *See* Pope Benedict XVI, *Caritas in Veritate* [Encyclical Letter on Charity in Truth] ¶ 67 (2009), available at [http://www.vatican.va/holy\\_father/benedict\\_xvi/encyclicals/documents/hf\\_ben-xvi\\_enc\\_20090629\\_caritas-in-veritate\\_en.html#\\_edn20](http://www.vatican.va/holy_father/benedict_xvi/encyclicals/documents/hf_ben-xvi_enc_20090629_caritas-in-veritate_en.html#_edn20).

52. *See id.* ¶ 37.

53. *Id.* ¶ 7.

54. *See id.* ¶¶ 46-47.

55. *See id.* ¶ 41.

56. *Id.*

57. *See* Pope Benedict XVI, *Caritas in Veritate* [Encyclical Letter on Charity in Truth] ¶ 24 (2009), available at [http://www.vatican.va/holy\\_father/benedict\\_xvi/encyclicals/documents/hf\\_ben-xvi\\_enc\\_20090629\\_caritas-in-veritate\\_en.html#\\_edn20](http://www.vatican.va/holy_father/benedict_xvi/encyclicals/documents/hf_ben-xvi_enc_20090629_caritas-in-veritate_en.html#_edn20).

## 6. Transparency

Benedict hopes that all international agencies and NGOs will commit themselves to complete transparency about their income, programs, and detailed expenditures,<sup>58</sup> to prevent their own internal bureaucracies from consuming—just to perpetuate themselves—an excessively high percentage of funds intended for development.

### D. CSD in Other Catholic Documents

The same concepts and requests summarized in the previous paragraphs are of course present also in countless other Catholic documents from individuals and institutions at all levels. I would like to quote, as just one example, this call for transparency in Zambia that is substantially identical to the one in CiV: “Much more strict monitoring of budgetary allocations and actual expenditures on food security measures is essential if progress is to be made in meeting the needs of the people.”<sup>59</sup>

Equally relevant are the writings on poverty that describe it as the explicit outcome of “the way we humans have designed the . . . structures of society.”<sup>60</sup> Others write that Catholic teaching on poverty has grown to acknowledge the importance of property for the poor “in multiple senses of land, capital, education, and technological know-how.”<sup>61</sup>

At a more official level, I may mention, as just one example, the U.S. Conference of Catholic Bishops. Almost thirty years ago, the Conference called for new forms of cooperation and partnership because poverty entails a denial of full, active participation in the life of society.<sup>62</sup> In the same occasion, the Conference also said: “[T]he most appropriate and fundamental solutions to poverty will be those that enable people to take control of their own lives.”<sup>63</sup> Ten years later, the same Bishops stressed the fact that this is not a “developing countries-only” issue, when they noted that the economy seemed to be leading to three nations living side-by-side inside the U.S.A.: one prospering and producing in a new information age; another wondering whether they will keep their jobs, health insurance, and good

58. *See id.* ¶ 47.

59. Peter Henriot, S.J., *Governance and Its Impact on Food Security in Zambia*, JESUIT CTR. FOR THEOLOGICAL REFLECTION, at 3 (2009), [www.jctr.org.zm/index.php?option=com\\_joomdoc&task=doc\\_download&gid=90&Itemid=76](http://www.jctr.org.zm/index.php?option=com_joomdoc&task=doc_download&gid=90&Itemid=76).

60. Henriot, *supra* note 14, at 1.

61. Fred Kammer, *Catholic Social Teaching (CST) and Poverty*, JUSTSOUTH Q. 1, 8 (2009), available at [www.loyno.edu/jsri/sites/loyno.edu.jsri/files/CSTandPoverty-Winter2009jsq.pdf](http://www.loyno.edu/jsri/sites/loyno.edu.jsri/files/CSTandPoverty-Winter2009jsq.pdf).

62. *See* U.S. Catholic Bishops, *Economic Justice for All: Pastoral Letter on Catholic Social Teaching and the U.S. Economy*, U.S. CONFERENCE OF CATHOLIC BISHOPS, ¶ 188 (1986), [http://www.usccb.org/upload/economic\\_justice\\_for\\_all.pdf](http://www.usccb.org/upload/economic_justice_for_all.pdf).

63. *Id.*

schools for their children; and a third wondering whether they can afford the rent, heat, and groceries.<sup>64</sup>

## II. NATURE, ROLE, AND SIGNIFICANCE OF SOFTWARE (AND COPYRIGHT)

Let us now look at some technologies and practices that may have, or already have, a deep impact on the topics covered in the first section. Many people still see software as something purely immaterial, somehow detached from the physical world. Reality is deeply different. Even if it were possible, going back to the pre-software age would make no sense; still it is true, in a sense, that software is “eating the world.”<sup>65</sup> Software is not a stand-alone industry or set of tools. It is something that makes every other physical or immaterial economic activity work, from agriculture to space travel and to every service from mere bureaucracy to healthcare, education, tourism, and lotteries.

Software performs automatically, in milliseconds, huge quantities of stock market transactions in all sectors of the economy (including pension funds). Modern cars contain so much software that independent technicians have lost, regardless of their skills, their right to repair them because some repairs require software that car companies only give to selected partners. In some countries, software is already destroying more jobs that used to require a university degree than “low level,” purely manual ones.

Software, which when properly used can greatly reduce pollution and waste in all fields of human activity, also has a huge, but often unnecessary environmental footprint; dismissing perfectly working computers or smartphones (only because the next fashionable operating system demands more memory) produces thousands of tons of unnecessary toxic waste.

Today everything from phone calls and live T.V. to texts, health records, and engineering designs is encoded in bits read and written through software. Software already has an exclusive mandate to package and access almost every kind of information and communication we need to live.

Among other things, this makes several discussions about copyright and intellectual property moot. Who really controls the right to copy a novel or the diagrams of some invention is not their author: it's the author of the software used to write and save those documents as digital files. If the format of those files were secret and that software became unavailable, copying the files may still be technically possible, but it would be useless.

Without software and digital content (both online and offline) in their own native language, many people (especially poor people) lose the oppor-

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64. See United States Conference of Catholic Bishops, Inc., *A Decade After “Economic Justice for All”*: *Continuing Principles, Changing Context, New Challenges*, 3 (1996), <http://www.usccb.org/issues-and-action/human-life-and-dignity/global-issues/trade/upload/a-decade-after-economic-justice-for-all-1995-11.pdf>.

65. See Marc Andreessen, *Why Software is Eating the World*, WALL ST. J., (Aug. 20, 2011), <http://online.wsj.com/news/articles/SB10001424053111903480904576512250915629460>.

tunities for real development that computers and the Internet can offer, including those described in the next chapter. India, with its millenary history and hundreds of languages, has been defined as the only country in the world where people are forced to buy fonts, that is the digital versions, of their native alphabets.<sup>66</sup> Iceland, one of the oldest and most literate nations in Europe, in 1998 was too small of a market to deserve its own version of Windows.<sup>67</sup> In Ethiopia, the lack of both computer interfaces and Google search in Afaan Oromo (the fourth language in Africa by number of native speakers) has been a primary cause of digital divide.<sup>68</sup> Even ignoring languages, a small business owner in an emerging country may technically “pirate” Western accounting software, but in order to use it he should also do business only the Western way, putting aside any other commercial practice or transaction model (e.g., bartering), no matter how relevant it may be culturally and historically in his native community.

Software and digital technologies can also do wonders to preserve local cultures and, as we’ll see, improve the life of the poor. Projects like Literacy Bridge<sup>69</sup> used custom recorders as audiobooks to save and distribute traditional songs, tales, and recipes. Today the same activity may be performed with most smartphones.

Summing it up, software can do much both to flatten and preserve (among other things) culture. We may well say that in modern society software is and creates (or destroys) culture. Therefore, assuming that all types of software usage and development models are substantially equivalent for society is very dangerous.<sup>70</sup>

Another consequence to property of doing everything with and through software is this: today, if you do not own or control the software you use (often unwillingly or unknowingly), you don’t really own or control much of anything.<sup>71</sup> For all these reasons—that is, for the actual, if invisible, power it gives to those who write and control it—it has been said that software is legislation. The will to increase the real control on individuals and society that software can give to very few people is behind what writer

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66. See APCNews, *Bitter-sweet: Mixed Feelings About Working to Indian Language Solutions*, ASS’N FOR PROGRESSIVE COMM., <http://www.apc.org/en/news/diversity/world/bitter-sweet-mixed-feelings-about-working-indian-1> (last visited Feb. 19, 2014).

67. See Mary Williams Walsh, *Iceland Fears Life Without Own Windows Language*, THE BALTIMORE SUN, (July 4, 1998), [http://articles.baltimoresun.com/1998-07-04/news/1998185007\\_1\\_iceland-language-policy-microsoft](http://articles.baltimoresun.com/1998-07-04/news/1998185007_1_iceland-language-policy-microsoft).

68. See generally THE MAIL ARCHIVE, <http://www.mail-archive.com/dev@110n.openoffice.org/msg05923.html> (last visited Oct. 11, 2013) (presenting emails from Ethiopian programmers to the OpenOffice.org translation mailing list).

69. See generally LITERACY BRIDGE, [www.literacybridge.org](http://www.literacybridge.org) (last visited Oct. 11, 2013) (discussing how the program uses the talking book to distribute educational programs to its end user).

70. Cf. Pope Benedict XVI, *supra* note 2, ¶ 26 (warning against cultural eclecticism and cultural leveling because of the risk of social degradation).

71. Cf. *id.* ¶ 24 (comparing technology and economics of the past with that of the present).

Cory Doctorow calls the “Coming War on General Computation,”<sup>72</sup> as well as extensions for the digital age of the Human Rights Declaration.<sup>73</sup>

Besides being legislation, software also enforces and sometimes creates intellectual property. When we think of how many design activities and manufacturing processes happen today inside software programs, or under their complete control, we can see that software also is a hugely flexible means of production. As such, it already is within the scope of CSD. Should not this connection be explicitly acknowledged?<sup>74</sup>

### III. THE OPENNESS REVOLUTION

Computers (of all sorts, from mainframes to smartphones), the Internet, and software (especially the “FOSS” Software described in the next paragraph) have created many opportunities for cooperation and production in many fields. Just for the sake of brevity and simplicity, in this paper all those opportunities are collectively called “Open,” or “Openness Revolution.” Some of the most interesting ones are described in the following paragraphs. Before looking at them in more detail, it is proper to point out some of their common characteristics. The first is that none of these activities could exist, on a large scale at least, without computers, FOSS and the Internet (at least as open as it has been until now), which really enables individuals across the world to work together. Secondly, they are all based on a “share-and-share alike” attitude, which is what gives these activities the “Open” qualification.

Third, that attitude is promoted and enforced, not by violating copyright, but by deliberately using it (through proper licenses) in ways that:

1. explicitly add gratuitousness, cooperation, and reciprocity to the picture;<sup>75</sup>
2. enable, and explicitly encourage everybody with the need and the right skills to solve a problem to be active and do it, without permissions from above or complicated procedures;
3. do not renege ownership: every active participant continues to own the copyright of his or her contribution to the project, but freely decides to not use that ownership in certain ways, thus remaining, to use the language of “Laborem Ex-

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72. See Cory Doctorow, *The Coming War on General Purpose Computation*, BOING BOING (Dec. 27, 2011), <http://boingboing.net/2011/12/27/the-coming-war-on-general-purp.html>.

73. See *The Hague Declaration*, DIGITAL STANDARDS ORGANIZATION, [www.digistan.org/hague-declaration:en](http://www.digistan.org/hague-declaration:en) (last visited Oct. 27, 2013).

74. Cf. Pope Benedict XVI, *supra* note 2, ¶¶ 34-38 (arguing against a market economy and for a market system where all are able to give and receive).

75. Quite often, the only condition to be able to take and reuse something Open is that one’s contributions and changes are also made available to everybody else who may need them, at the same conditions. Please note that this is just a simplification! In reality, there are several types of Open licenses and several distinctions among use cases that make things more varied. This paragraph only aims to provide a general, approximate overview of how Openness often works.

- cerns” “part-owner of the great workbench at which he is working with everyone else;”<sup>76</sup> and
4. mitigate some negative (from a CSD point-of-view) aspects or risks of the ownership of means of production, namely those that would, as John Paul II put it “impede the work of others.”<sup>77</sup>

Fourth, just because the material and immaterial results of these activities are Open, they contribute to free both individuals and whole societies from “all-or-nothing” choices at the economical, technical, or cultural levels. People are legally free to take only the parts of an Open project that interest them and modify them as they wish until they work as they really need.

Finally, these activities often are not what could provide the most innovative, optimized and profitable results . . . according to the criteria of current mainstream economy. Equally often, however, their achievements may be not only those most closely matching the real needs of many people, but also the only realistic and most sustainable ones in many contexts.

#### A. *Free/Open Source Software (FOSS)*

The acronym FOSS is most commonly used to refer to that huge and very important class of software that is called, depending on who you ask, either “Free” or “Open Source.” While the two definitions reflect two distinct, not necessarily overlapping approaches to software, they are combined because they refer to more or less the same corpus of software programs and practices for their development and distribution.

“Free Software” is basically an ethical definition. It means software created to be “free as in freedom,” not (necessarily) free as in “free beer.” This is software that everybody is explicitly allowed to study, modify, share, and redistribute without paying fees or other restrictions; the only condition is that the same freedoms must be guaranteed to the users of the modified version. Free Software envisions a community of programmers and users that work together towards their common good and the increase of (software) knowledge freely available to everyone.

“Open Source,” instead, describes software development done in the same practical ways (collaborative development, software source code freely reusable, etc.), but for purely pragmatic and economical reasons. Open Source is a winning model, for example, if a software program is so complex that one single group could never afford to develop it alone and/or its core business is not selling software products, but software-related services (this includes public administrations). This does not exclude the “Free Software” motivation, but does not need it either.

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76. Pope John Paul II, *supra* note 32, ¶ 14.

77. Pope John Paul II, *supra* note 3, ¶ 43.

However it is called, FOSS is not a theoretical proposition: it is what already keeps the current open Internet running. Very popular desktop programs like the OpenOffice/LibreOffice suites or the Firefox browser are FOSS, and so is a significant part of the Android operating system for smartphones.<sup>78</sup>

What is really important in FOSS, in the context of this paper, is one specific consequence of the availability of the source code and of its license: as long as volunteer programmers, or the resources to hire programmers, are available, FOSS is the only software that can always be legally reused, localized, or modified in any way to fit one's real needs, even if its original developer disappears.

### B. *Open Hardware*

Digital integrated circuits ("ICs") are thin slices of silicon enclosed in plastic packages on which thousands or millions of transistors are printed.<sup>79</sup> The actual function of a specific IC is only defined<sup>80</sup> by how those transistors are actually connected to each other (the connections are microscopic strips of metal printed on the IC itself). In other words, depending on the actual number and layout of those connections,<sup>81</sup> ICs built starting from the same basic array of transistors on silicon can become modems, programmable car brake controllers, computer microprocessors, or thousands of other electronic products. Some classes of ICs even allow the user to redefine the connections—that is, what the IC actually is—at every power-up, rather than once-and-for-all at manufacturing time.

Together, ICs and other components, collectively called microelectronics, are what make possible countless products from, missile control systems to smartphones.<sup>82</sup> Recent advances in microelectronic manufacturing have made certain ICs cheap enough that designing them in the same way as FOSS has become both possible and useful for many people worldwide. This is what is usually called the "Open Hardware" movement, even if the same definition also applies to similar activities for other classes of products. The best example of microelectronics Open Hardware success is the

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78. See, e.g., Katherine Noyes, *Is Android Open? Not So Much, Study Finds*, PCWORLD [http://www.pcworld.com/article/246140/is\\_android\\_open\\_not\\_so\\_much\\_study\\_finds.html](http://www.pcworld.com/article/246140/is_android_open_not_so_much_study_finds.html) (last visited Dec. 13, 2011).

79. See, e.g., *Integrated Circuit Definition*, TECHTERMS, [www.techterms.com/definition/integratedcircuit](http://www.techterms.com/definition/integratedcircuit) (last visited Oct. 27, 2013).

80. This is an approximation, but it is correct enough for the purpose of this paper.

81. This is what is usually called a circuit diagram.

82. For nontechnical summaries of the importance, history, and variety of ICs, see *Integrated Circuit Background*, HOW PRODUCTS ARE MADE, [www.madehow.com/Volume-2/Integrated-Circuit.html](http://www.madehow.com/Volume-2/Integrated-Circuit.html) (last visited Oct. 27, 2013) and *Design & Technology: Integrated Circuits*, BITESIZE, [www.bbc.co.uk/schools/gcsebitesize/design/electronics/integratedrev1.shtml](http://www.bbc.co.uk/schools/gcsebitesize/design/electronics/integratedrev1.shtml) (last visited Oct. 27, 2013).

Arduino microcontroller,<sup>83</sup> whose complete starter kit costs seventy-nine Euro.<sup>84</sup> Arduino is already used to build everything from toys to hydroponic control systems and all sorts of remote sensing equipment.<sup>85</sup>

### C. 3D Printing

The term 3D printing is the most fashionable name of a process which is more appropriately defined as additive manufacturing.<sup>86</sup> In traditional manufacturing, special machines “extract” an object of the desired shape by removing all the parts in excess from bigger blocks of raw matter.

Additive manufacturing works in the opposite way: objects are assembled layer-by-layer, by adding tiny drops of material (usually plastic, at least for cheap and/or hobbyist-level products) one at a time. The 3D printing name comes from the similarity of this process with normal printing, which consists of placing drops of ink on paper. The exact position of each drop is defined by instructions in a digital file.

While 3D printing is not (yet) as efficient and mature as traditional machinery and assembly lines, it also has several characteristics that make it particularly interesting in the CSD context.

The use of 3D printers is perfect for low or very low volume production—the very kind of production that may be appropriate even for (networks of) villages and other small communities in developing countries, with little or no money to invest in machinery. The same 3D printer can produce a different object every time it runs, as long as it is fed with a different design file. This also makes 3D printing perfect to produce on demand spare parts of obsolete products that may not be commercially available.

Several activists and researchers are already studying how to use 3D printing for social and economic development (the usual acronym for this activity is 3D4D), that is to produce in this way objects needed in poor communities worldwide: the winner of the 2012 3D4D Challenge was a

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83. See ARDUINO, <http://arduino.cc/> (last visited Oct. 27, 2013).

84. As of September 2013, an official starter kit came complete with printed manual, cables, and other components. See *Arduino Starter Kit*, ARDUINO, [http://store.arduino.cc/ww/index.php?main\\_page=product\\_info&cPath=2&products\\_id=185](http://store.arduino.cc/ww/index.php?main_page=product_info&cPath=2&products_id=185) (last visited Oct. 27, 2013).

85. See *Exhibition*, ARDUINO, <http://playground.arduino.cc/projects/arduinoUsers> (last visited Oct. 27, 2013).

86. See *3D Printing*, WIKIPEDIA, [http://en.wikipedia.org/wiki/3D\\_printing](http://en.wikipedia.org/wiki/3D_printing) (last visited Oct. 27, 2013).

design for a one person fishing boat, 3D printed from recycled plastic.<sup>87</sup> Others are studying how to 3D print more efficient photovoltaic panels.<sup>88</sup>

The most interesting part of 3D printing, however, is that just like FOSS, it can be open, collaborative, and affordable: entry level 3D printers can cost as little as one hundred dollars, including models like the RepRap,<sup>89</sup> that is Open Source and able to make copies of itself. Design files for thousands of objects are already freely available online, just like it happens with FOSS, in online communities like Thingiverse.<sup>90</sup>

#### D. *Open Manufacturing and Agriculture*

Open, collaborative design and manufacturing is not limited to immaterial or small size products or, more generally, non-primary needs of lucky citizens in the most advanced societies. The Open Source Ecology project is just the first “Network of Farmers, Engineers, and Supporters Building the Global Village Construction Set:” Open Source prototypes, designs and production instructions of fifty machines, from tractors to brick presses, necessary to build “a small, sustainable civilization with modern comforts.”<sup>91</sup> Another huge resource of Open technology for development is Appropedia.<sup>92</sup> This community for “collaborative solutions in sustainability, poverty reduction and international development” helps to design and build everything, from solar ovens to wind turbines and family toilets, with the smallest possible amount of resources.<sup>93</sup>

Even food production, as requested by “Caritas in Veritate,” may benefit from existing Open Source techniques and communities.<sup>94</sup> Small Open Source drones may be used to monitor the status of crops and livestock.<sup>95</sup> Open designs for small hydroponic gardens (including indoor ones that may help bring fresh produce even to urban slums and food deserts), sometimes

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87. See *A Third-world Dimension: A New Manufacturing Technique Could Help Poor Countries As Well As Rich Ones*, THE ECONOMIST, (Nov. 3, 2012), [www.economist.com/news/science-and-technology/21565577-new-manufacturing-technique-could-help-poor-countries-well-rich-ones](http://www.economist.com/news/science-and-technology/21565577-new-manufacturing-technique-could-help-poor-countries-well-rich-ones).

88. See John J. Licata, *How 3D Printing Could Revolutionise the Solar Energy Industry*, ENVIRONMENT BLOG (Feb. 22, 2013), [www.guardian.co.uk/environment/blog/2013/feb/22/3d-printing-solar-energy-industry](http://www.guardian.co.uk/environment/blog/2013/feb/22/3d-printing-solar-energy-industry).

89. See REP RAP, <http://reprap.org/> (last visited Oct. 27, 2013).

90. See THINGIVERSE, [www.thingiverse.com/](http://www.thingiverse.com/) (last visited Oct. 27, 2013).

91. OPEN SOURCE ECOLOGY, <http://opensourceecology.org/> (last visited Oct. 27, 2013).

92. See APPROPEDIA, <http://appropedia.org/> (last visited Oct. 27, 2013).

93. *What is Appropedia?*, APPROPEDIA, [www.appropedia.org/Appropedia>About](http://www.appropedia.org/Appropedia>About) (last visited Oct. 27, 2013).

94. Cf. Pope Benedict XVI, *supra* note 2, ¶ 27 (discussing the food shortages in poor countries).

95. See, e.g., Iavor Diatchki, *Tech Talk: Chris Anderson on Using Drones in Agriculture*, GALOIS (Sept. 12, 2013), <http://corp.galois.com/blog/2013/9/12/tech-talk-chris-anderson-on-using-drones-in-agriculture.html> (describing a public presentation on agricultural drone use); Chris Anderson, *Agricultural UAVs*, DIY DRONES, <http://diydrone.com/group/agricultural-uavs> (last visited Oct. 2, 2013).

controlled by Arduino circuits, are also available online.<sup>96</sup> Even where there is no need (or budget) for such advanced technologies, production of Open Education Resources,<sup>97</sup> like agriculture manuals with Creative Commons licenses, may minimize the costs of disseminating whatever knowledge is needed to sustainably increase the yields of the fields.

### E. Open Mapping

Cartography carries political messages, but it can also be an act of social self-affirmation. The *Mapping Hacks* book says “[m]ap or you will be mapped” because who draws the maps controls how (and if) others see the world.<sup>98</sup> Very often, proprietary online maps are almost useless in developing countries. They show every possible detail of “rich” places, but little or nothing of poor ones because mapping them could never be profitable for a traditional private corporation.

The Gaza Strip is a perfect example of both this problem and its solution. The Strip looks almost empty on Google Maps, but its ambulance drivers quickly reach people in need anyway, thanks to OpenStreetMap, which thousands of volunteers worldwide improve every day.<sup>99</sup> OpenStreetMap also makes it much easier for linguistic minorities to build and preserve state-of-the-art digital representations of their own land, history, and culture, in their own language, with their own symbols.

Other relevant projects that show how open, collaborative mapping helps the poor are Ushahidi,<sup>100</sup> which did a great job after the Haiti earthquake,<sup>101</sup> and New Social Cartography of the Amazon.<sup>102</sup> The latter project produces greater knowledge about land grabbing in the Amazon, helping local social movements to combat it.<sup>103</sup>

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96. See *What is GardenBot?*, GARDENBOT, <http://gardenbot.org/about/> (last visited Oct. 27, 2013); ROBOTGARDENER, <http://robotgardener.com/> (last visited Oct. 27, 2013).

97. For a discussion of Open Educational Resources, see Open Knowledge and Education, *infra* pp 119–121.

98. Press Release, Secretary-General, In Address to ‘Learning Never Ends’ Colloquium, Calls Education Investment Which Yields Highest Profit, U.N. Press Release SG/SM/7125 (Sept. 10, 1999), available at <http://www.un.org/News/Press/docs/1999/19990910.sgsm7125.doc.html>.

99. See OPENSTREETMAP, <http://openstreetmap.org/> (last visited Oct. 27, 2013).

100. See USHAHIDI, [www.ushahidi.com/](http://www.ushahidi.com/) (last visited Oct. 27, 2013).

101. See generally, Patrick Philippe Meier, *Haiti and the Power of Crowdsourcing*, USHAHIDI, <http://blog.ushahidi.com/2012/01/12/haiti-and-the-power-of-crowdsourcing/> (last visited Oct. 27, 2013) (describing how Open mapping helped find earthquake victims in the rubble).

102. See NOVA CARTOGRAFIA SOCIAL DA AMAZÔNIA, [www.novacartografiasocial.com/](http://www.novacartografiasocial.com/) (last visited Oct. 27, 2013).

103. See Thiago Borges, *New Social Cartography of Amazon Protecting Indigenous*, INFOSURHOY, [http://infosurhoy.com/cocoon/saii/xhtml/en\\_GB/features/saii/features/main/2011/10/04/feature-02](http://infosurhoy.com/cocoon/saii/xhtml/en_GB/features/saii/features/main/2011/10/04/feature-02) (last visited Oct. 27, 2013).

### F. *Open Data*

Among other things, responsible participation in public affairs<sup>104</sup> requires that all citizens can (both technically and legally) analyze and reuse the raw data produced or used by their public administrations to do their job. This approach to collaborative production, use and sharing of Public Sector Information (“PSI”), called Open Data, is the basis of Open Government and is more than transparency: on the one hand, it explicitly encourages active participation and reuse of data for both civic activism and economic development; on the other hand, it requires that data are published in ways that make it easy to analyze them automatically. The Open Data movement is already active worldwide, and has already produced significant results and practical guidelines. Describing them here would take too much space, so I will refer the reader to my Open Data, Open Society reports to know more.<sup>105</sup> Here, it will be enough to say that Open Data may also help both to free public money to help the poor and the poor themselves to get more control of their lives.

### G. *Open Knowledge and Education*

None of these great opportunities for real human development could do much without the capability to understand and use them independently, that is without access to adequate education. Italian Catholic Priest Don Lorenzo Milani (1923–1967), known as an educator of poor children, wrote that “the factory worker knows one hundred words, the factory owner 1000, that’s why the master is the latter.”<sup>106</sup> Former UN Secretary Kofi Annan said “[e]ducation is, quite simply, peace-building by another name. It is the most effective form of defense spending there is.”<sup>107</sup> Quality education, both in general and as training in the very fields presented in the previous

104. See Pope Benedict XVI, *supra* note 2, ¶ 24.

105. See Marco Fioretti, *Open Data, Open Society*, STOP, <http://stop.zona-m.net/2011/01/the-open-data-open-society-report-2/> (last visited Oct. 27, 2013). For the follow-up report, see Marco Fioretti, *Open Data: Emerging trends, issues and best practices*, <http://stop.zona-m.net/2011/09/open-data-emerging-trends-issues-and-best-practices/> (last visited Oct. 27, 2013).

106. The original Italian version of that sentence is “l’operaio conosce 100 parole, il padrone 1000, per questo è lui il padrone.” That sentence is attributed as is to don Milani in countless Italian articles, papers, books, and conferences presentations. While there is no doubt at all in Italy that it is authentic, it seems that this is a condensed version that don Milani only put in writing on a wall of his school in Barbiana, Tuscany about fifty years ago. The same concept was expressed in his 1958 book “Esperienze Pastorali.” See generally Monsignor L. Adami, *La Cura Delle Relazioni in Don L. Milani*, [http://www.magverona.it/wp-content/uploads/2011/09/master-2010\\_01\\_dispensa-ADAMI.pdf](http://www.magverona.it/wp-content/uploads/2011/09/master-2010_01_dispensa-ADAMI.pdf) (last visited Oct. 27, 2013) (discussing Milani’s 1958 book entitled *Esperienze Pastorali*).

107. See, e.g., Karin Ronnow, *Education Builds Peace and Prosperity; It’s That Simple*, CENTRAL ASIA INSTITUTE, <https://www.ikat.org/2013/03/29/march-29-2013-education-builds-peace-and-prosperity-its-that-simple/> (last visited Oct. 27, 2013) (discussing a Pinterest webpage that supposedly quotes the book *Interventions: A Life in War and Peace* by Kofi Annan and Nader Mousavizadeh).

paragraphs, is essential to give the greatest opportunities to the greatest number of human beings.

Using the Internet, FOSS, and Open Content licenses as Creative Commons,<sup>108</sup> worldwide movements for Open Culture, Open Access to academic research, Open Educational Resources (“OERs”), and Open Education are already trying to fill this need: online communities like Connexions, to name just one example, already produce thousands of reusable courseware modules on many topics.<sup>109</sup> Just like FOSS, this is all content that is legally reusable and adaptable, without paying royalties, to real needs of local cultures and job markets.

Of course, none of these movements, nor distance learning in general, can entirely replace working face-to-face with good teachers. But the problem is that while more education is sorely needed soon, there are not enough good teachers or resources to provide it the old way to all those who need it.

If we keep this sad fact firm in mind, it is hard to ignore that those Open movements may be the only way to make basic education spread fast: “it’s not school . . . but there is learning.”<sup>110</sup>

Thanks to their Open licenses and to the fact that they are almost always already online, OERs also are among the content that is easy to translate and port to basic smartphones. Considering that, in March 2013, the United Nations announced that more people worldwide have mobile phones than toilets, even in developing countries, this is no secondary feature.<sup>111</sup> It would be a pity not to use those phones to spread education.

At the same time, FOSS and Open licenses greatly facilitate the production of educational resources that are usable without the Internet or any electronic device. One slogan of the Open Learning Exchange is “the power of the Web where there is no Web.”<sup>112</sup> Almost ten years ago, Uganda farmers without internet access were already studying agriculture manuals on CD-ROMS through Web browsers to reduce their learning curve.<sup>113</sup>

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108. See CREATIVE COMMONS, <http://creativecommons.org/> (last visited Oct. 27, 2013).

109. See CONNEXIONS, <http://cnx.org/> (last visited Oct. 27, 2013).

110. Ken Ronkowitz, *The Open Everything Movement*, SERENDIPITY35 (Jan. 16, 2008), <http://www.serendipity35.net/index.php?archives/497-The-Open-Everything-Movement.html>.

111. See *Deputy UN Chief Calls for Urgent Action to Tackle Global Sanitation Crisis*, UN NEWS CENTRE, [www.un.org/apps/news/story.asp?NewsID=44452&Cr=sanitation#.UYW8KovBMA](http://www.un.org/apps/news/story.asp?NewsID=44452&Cr=sanitation#.UYW8KovBMA) (last visited Oct. 27, 2013).

112. OPEN LEARNING EXCHANGE, <http://ole.org/> (last visited Oct. 27, 2013).

113. See Joyce Kyeyune, *Ugandan Mozilla Highlights Power of OSS Translation*, LINUX PLANET, [www.linuxplanet.com/linuxplanet/interviews/5567/1/](http://www.linuxplanet.com/linuxplanet/interviews/5567/1/) (last visited Oct. 27, 2013).

## IV. CONCLUSION

A. *What is CSD Again?*

As the first chapter shows, CSD, starting straight from the Bible and the teachings of Jesus, has always strongly proposed a society built on solidarity, subsidiarity, and common good. Such a society should help the poor by empowering them through government that is small in assistentialism but “big” in fair rules. Through active participation (at all levels, from family to State) and distributed ownership of means of production, that society should serve the real needs<sup>114</sup> of all its members, both at the spiritual and at the practical level.

The concrete challenges that come out of this proposal today are well represented by three questions that the U.S. Bishops asked almost twenty years ago:

1. How can our Church take a leadership role in calling those in positions of power to promote economic growth, job security, decent wages, and greater opportunities?
2. How can our community shape the priorities of our culture to promote greater personal responsibility and better economic choices?
3. How can business, labor, various levels of government, and mediating structures like churches, charities, and voluntary groups work together to overcome economic injustice and exploitation in our communities?<sup>115</sup>

B. *What Openness Is*

In my opinion, what I have called the “Openness Revolution” should be a necessary, important part of the answer to all the questions above, and a good application of CSD in general. “If development were concerned with merely technical aspects of human life . . . then the Church would not be entitled to speak on it.”<sup>116</sup> But the leading concepts behind all the technologies described in the previous chapter are not technical.

It should be evident from sections two and three that CSD cannot ignore software or the Openness Revolution anymore. Software, as we have seen, produces legislation and culture; therefore, understanding its nature belongs to ethics as much as to technical curricula, and making certain decisions about software is a responsibility that the heads of religious institutions cannot delegate to their Information and Communication Technology staff. Today, respect for the person should include making sure that each person can choose the software he or she really needs. Besides, CSD has

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114. Cf. Pope Benedict XVI, *supra* note 2, ¶ 7 (discussing the “common good” and doing what is best “for the people who belong to the social community”).

115. See U.S. Catholic Bishops, *supra* note 62, ¶ 19.

116. Pope Benedict XVI, *supra* note 2, ¶ 16.

always advocated a just distribution of means of production. Software and knowledge, albeit immaterial, are crucial, strategic means of production. Their just distribution implies (without excluding private initiative and profit) their opening.

Just like CSD, Openness is not, and never can be, a direct endorsement of any single product, brand, company, country, or political system. Openness is, first of all, a way of working and regulating some technologies. All the practices and movements described in the previous section are:

1. legally and deeply adaptable to very diverse, local, real needs and the common good of all their users without special permissions, at the smallest possible cost;
2. perfect for decentralization at the lowest possible levels;
3. driven by, and supportive of, free and spontaneous initiatives, by individuals and communities, and voluntary, participated work, instead of assistentialism from above;
4. not driven by profit, even if they do not exclude it;
5. based on means of production that (at least in the immaterial parts) really belong to all their users, thus distributing ownership at a much bigger and more resilient scale, than would have been possible even a few years ago;
6. usable, and already used, to build tools of peace of all sorts, from tractors to textbooks; and
7. beneficial even for people without (broadband) internet access.

What about globalization and subsidiarity? Since the times of Paul VI, development in CSD implies active participation of peoples, “on equal terms, in the international economic process.”<sup>117</sup> Openness makes this easier, turning globalization, that is access to appropriate knowledge and to the most efficient means of production, to the poor’s advantage. In this sense, it seems a bit like globalization done right.

On top of that, it is subsidiarity itself, which I may summarize again as “whenever people can do something by themselves, help them to do so!”, that requires and contains Openness. Benedict points out that the new context of international trade and finance limits the sovereignty of States.<sup>118</sup> This lessening of power of the States puts subsidiarity in danger: no State may delegate powers and tasks that it completely or partially lost due to globalization, international trade treaties and intellectual property abuses. By encouraging Openness, States can get back some of their power to offer subsidiarity. Besides, promoting Openness reduces unnecessary costs, freeing important resources for more critical tasks, and increases the free circulation of solutions.

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117. *Id.* ¶ 21.

118. *See id.* ¶ 24.

Today, Open techniques are often used to build “first world only” gadgets and services. However, they also seem made to order to fight consumerism and help the poor more efficiently, at the smallest possible cost. Openness already exists and does not require any “extension” or changes to CSD. In a way, we may say that Openness may be used to implement with Information and Communication Technology the orthodox CSD that already exists.

Another way to express the same concept is that, if we had to build from scratch technologies and ways to use them that match CSD point-by-point, the result would be unavoidably very, very similar to what is described in section three. So, why do it from scratch?

The Open Revolution is based on technology, and Paul VI and Benedict XVI rightly warned against “the great danger of entrusting the entire process of development to technology alone.”<sup>119</sup>

Indeed, in general, any technology can create new divides, increase exploitation instead of fighting it, or encourage its own idolization. The Open solutions described here, however, do not depend only on the smallest possible number of technocrats as it happens with closed, proprietary systems. By design, they not only enable, but encourage all the people and communities using them to “look under the hood,” to take control and modify the “machine” until it really suits them, or to ask for help to do that. Besides, the proposal here is exactly to acknowledge and use Open technologies and practices as one of the necessary tools to support real human development, never as “saviors” to be idolized.

As far as I am concerned, the Openness Revolution also proves the timelessness and modernity of CSD and, in general, of the message of the Church: it is a bit like CSD had already conceived, decades or centuries ago, solutions so advanced that technology has been able to build the necessary tools only in recent years.

That is why, in my opinion, while Openness is good in and by itself, Catholics have even more reasons than others to promote, teach, and use it. Incidentally, this assertion may be extendable to every religion, belief system, or NGO that proposes subsidiarity, care for the poor, and similar goals (of course, this does not mean the opposite, that is, that one should be Catholic or, for that matter, “support” any established religion, in order to appreciate and practice Openness).

### C. *In Practice*

I started looking at these topics in 2005 when I published the article titled *Free Software’s Surprising Sympathy with Catholic Doctrine*.<sup>120</sup> Its

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119. *Id.* ¶ 14.

120. See Marco Fioretti, *Free Software’s Surprising Sympathy with Catholic Doctrine*, LINUX, <http://archive09.linux.com/feature/49533> (last visited Oct. 27, 2013).

first results were the practical proposals that, in 2006, I and the other co-founders of the Eleutheros Project put in the Eleutheros Manifesto.<sup>121</sup> Those proposals are still valid today and perfectly in line with the thesis of this paper, so my first suggestion is to follow them.

Today, even more than in 2005, Open technologies and practices can do much good for culture, economy, education, and public services. Therefore these days, in my humble opinion, teaching and practice of CSD cannot avoid to include, at all levels, from universities and seminaries to parishes:

1. education to the real nature and role of software; and
2. teaching, promotion, and practice of Openness, as presented here.

Does this mean that all clerics (or all Catholics, for that matter) should become hackers or software programmers? Of course not. It just means that they should all be aware of these issues and opportunities, so that, whenever it is appropriate and useful, they can use, teach, and promote them, by themselves or seek assistance from experts.

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121. *See* ELEUTHEROS, [www.eleutheros.org/](http://www.eleutheros.org/) (last visited Oct. 27, 2013).