

See discussions, stats, and author profiles for this publication at: <https://www.researchgate.net/publication/263483158>

The road to facility management

Article in *Facilities* · January 2014

DOI: 10.1108/F-09-2012-0072

CITATIONS

27

READS

1,913

4 authors, including:



Inês Flores-Colen

Instituto Superior Técnico University of Lisbon

200 PUBLICATIONS 2,294 CITATIONS

[SEE PROFILE](#)



Ab Reitsma

Hanzehogeschool Groningen

5 PUBLICATIONS 29 CITATIONS

[SEE PROFILE](#)

Some of the authors of this publication are also working on these related projects:



SLPforBMS [View project](#)



WGB_Shield - Shielding Buildings' Facades on Cities Revitalization. Triple resistance for water, graffiti and biocolonization of external thermal insulation systems (PTDC/ECI-EGC/30681/2017) [View project](#)



The road to facility management

Dore Steenhuizen

*Hanze University of Applied Sciences Groningen, Groningen, The Netherlands
and Technical University of Lisbon (IST), Lisbon, Portugal*

Inês Flores-Colen

*Department of Civil Engineering, Architecture and Georesources,
Technical University of Lisbon (IST), Lisbon, Portugal*

A.G. Reitsma

*School of Facility Management, Hanze University of Applied Sciences Groningen,
Groningen, The Netherlands, and*

Pedro Branco Ló

Associação Portuguesa de Facility Management (APFM), Lisbon, Portugal

Abstract

Purpose – The purpose of this paper is to gain insight into facility management in Portugal as well as in Europe and what a facility management study programme must entail in Portugal in order to implement this.

Design/methodology/approach – The paper describes the mixed-methods approach. Both qualitative and quantitative methods are used based on extensive literature research of the subject. Semi-structured interviews were held with ten professionals from the FM field. The quantitative method was in the shape of a questionnaire sent to 40 professionals in Europe.

Findings – The results show that Portugal is not on the same level as the rest of Europe when it comes to FM. Also, FM is rather of a technical nature and lacks service orientation and managerial elements. Moreover, Portugal should first focus on creating awareness about the field of FM and provide FM study programmes accordingly. Research shows that this could be a lengthy process.

Originality/value – Currently there is no facility management study programme offered in Portugal. However, by gaining insight into this field and how facility management is of great added value to the market, a step closer to implementing a study programme is taken.

Keywords Education, European Union, Facilities management, Portugal

Paper type Research paper

1. Introduction

Facility management (FM) is a rather new field in today's market. It was only in the year 1978 that the International Facility Management Association (IFMA) was formed in the USA. In 1984, FM was "pushed" to Europe by the European Facility Management Network (EuroFM) to "advance the knowledge in FM in Europe and its application in Practice, Education and Research". After the first introduction of FM in Europe, the importance of FM grew rapidly.

Although many European countries are familiar with the field of FM and offer FM education, a standard FM education does not across Europe. Due to the ever- changing global environment, both economically as well as technologically, the field of FM emerged and the need for it increased accordingly. Slowly but surely companies recognised the efficiency, productivity, competitive advantage and cost savings benefits that FM has to offer within any organisation. However, FM both as a



profession as well as an educational field has not reached equilibrium on a worldwide or European basis.

Portugal is currently in the process of restructuring and redefining FM in the Portuguese market. A part of this restructuring is the provision of educational opportunities to enhance the FM knowledge and training. Hence, the purpose of this paper is to gain insight into FM in Portugal (as well as in Europe) and what a FM study programme must encompass in order to be offered as a proper study programme in Portugal.

The main question that lingers here is: “How can the APFM best support the Portuguese market’s need, by implementing a Facility Management study programme?”

2. Background

Due to the unique history and development of Portugal, FM has “penetrated” the market only recently. As a result, FM has not grown into becoming an official field of education offered at universities. To this date, there are no FM degrees. Even though the Portuguese Association of Facility Management (APFM) strives for a new FM study programme (and hence, boosting the life of FM within Portuguese market), neither they nor educational institutions have succeeded yet in implementing a recognised FM study programme. In addition the market is simply not aware of the benefits that FM has to offer.

On a larger scale, FM is widely accepted in Europe, although it has a different meaning depending on the country. For example, FM in The Netherlands is mostly focused on the provision of services; FM being a more service oriented field. Whereas in the UK, Germany and Austria FM is more concerned with technical aspects such as property and building management. This is seen as soft (managerial) and hard (technical) services, respectively.

3. Research methodology

Methods

For this study, the mixed-methods approach was used. This approach consists of both qualitative and quantitative research methods. According to Johnson *et al.* (2007), the approach combines the “elements of qualitative and quantitative research approaches for the purposes of breadth and depth of understanding and corroboration”. The qualitative research method was carried out by holding semi-structured interviews with professionals from the FM field. For the quantitative research a questionnaire was devised for the purpose of requiring numerical significance of this subject. Both methods were based on extensive literature review.

Literature review. The literature review served as the theoretical framework of FM and with that provided a clear and theoretical foundation of the subject. It entailed research through various books, journals, and essays. The research focused on the following three areas:

- (1) the professional field of Facility Management;
- (2) how it operates in Europe; and
- (3) its education opportunities in European countries.

Qualitative research. For the qualitative part of the mixed-methods approach, semi-structured interviews were held with professionals from the FM industry. The

- main goal of the interviews was to understand the perspective of Portuguese professionals from the following angles:
- Theoretical – what is their definition of FM on what this field of profession should look like?
 - Practical – what is their definition of FM within the organisation they work and how to deal with this professionally?
 - Educational – what kind of education would they suggest as best for the Portuguese market?

The interviews were held with ten Portuguese professionals. Contact with those professionals was made based on the APFM members list. Those were chosen based on their consent to participate. An e-mail was sent to a total of $N = 120$ Portuguese professionals. The ten interviewees provided a comprehensive view on the average facility manager in Portugal. Table I provides a clear view on the interviewees' profile on those ten participants based on educational background, gender, and current profession.

Quantitative research. Essentially, the quantitative research provided validation and verification to both the literature and the qualitative research carried out earlier. This research included a questionnaire consisting of 16 questions; 12 open questions and four multiple choice questions. It provided insight on the position of FM in the European market. Assorted non-Portuguese facility professionals, who currently operate in the market, participated in the questionnaire. The questionnaire was sent electronically to a total of $N = 40$ professionals in Europe, of which six came back. The turnout rate amounted to 15 per cent (6/40). Table II provides a clear view on the interviewees' profile on those six participants based on nationality, educational background, gender, and current profession.

Limitations

As the qualitative research was held with Portuguese professionals, who are all a member of the APFM, their opinion can lead to a restricted outcome. They share the vision of APFM and desire the implementation of a FM study programme in Portugal. In addition, some Portuguese FM professionals joined the APFM out of commercial perspective. Nevertheless, this group represents FM in Portugal. On the other hand, the interviewed non-Portuguese FM professionals base their opinion on complete different sources as they operate in a company or institution where FM is well-known and respected. Also, their educational background is more related to FM than those of the Portuguese professionals. Therefore, analysing the qualitative and quantitative research is rather conflicting as the two groups experience FM differently. Although

Table I.
Profile Portuguese
facility professionals
qualitative interviews

Educational background	Engineer at Master level: $n = 9$ Architect at Master level: $n = 1$
Gender	Male: $n = 7$ Female: $n = 3$
Current profession	Lecturer: $n = 1$ FM manager: $n = 6$ FM supplier: $n = 3$

Nationality	50 per cent is professional in The Netherlands 16 per cent is professional in the UK 16 per cent is professional in Finland 16 per cent is professional in Austria
Educational background	50 per cent is educated in the field of FM 50 per cent is educated in other fields like psychology, business administration and architecture Some of the above followed more than one study
Gender	Male: 66.6 per cent Female: 33.3 per cent
Current profession	All the participants are currently lecturing FM at universities.

Table II.
Profile European facility
professionals

the research provides a clear overview on the current FM market, it would not be fair to compare the Portuguese market to the European – the European market simply serves as an example.

4. State of the art

Definition

Due to the fact that FM developed unevenly across nations, various definitions have risen over the past decades. The most comprehensive definition is provided by the European Committee for Standardisation (CEN) as it incorporates the large range of FM:

Integration of processes within an organisation to maintain and develop the agreed services which support and improve the effectiveness of its primary activities.

Moreover, research shows (Maas and Pleunis, 2006; EuroFM, 2011; IFMA-IT1, 2011) that there are three pillars of FM that seem to be prominent – the basics of FM:

- (1) Three principles of FM:
 - people;
 - place; and
 - process.
- (2) FM is of supportive nature.
- (3) There are multiple disciplines.

Aside from the above-listed three “pillars”, the most important business model that all FM associations, companies, and organizations in the world adhere to and advocate is the EN 15221 standard. This standard has been developed by CEN and has become imperative in any FM related business to this day. Its main goal is to provide all facility managers with a great view on the scope of FM: space and infrastructure and people and organisation (CEN, 2006). In addition, it aims at providing a standardised framework, so that communication among them can be done in the same “language”:

- Improve communication between stakeholders.
- Improve effectiveness of primary activities and FM processes, as well as the quality of the output.
- Develop tools and systems.

The standard itself consists of six parts as shown in Table III.

Figure 1 illustrates the scope of FM – space and infrastructure and people and organisation. The FM agreement lies between the facility services and the core business (primary activities); between the provider and the organisation. That agreement is to be executed on three different levels within the organisation: strategic, tactical and operational. The services provided, the deliverables are measured according to key performance indicators (KPIs), which have to be of the agreed quality as agreed upon in the service level agreements (SLAs). This continues circle of providing a core business with facility services is named the European FM Model. The FM value could be described as a multi-dimensional and relationship value as “on a high level of abstraction, FM is the management of internal or external customer/client-supplier-relationships and helps differentiate between several FM-specific dimensions of benefits and costs”.

The European facility management market

FM is a fairly young player on the European market. According to Teichmann (2009) the FM market size is estimated at €640 billion. Teichmanns’ research is to “obtain data on the total expenditure on FM services as well as the ratio between internal and

Table III.
EN 15221

EN 15221 – 1, Part 1	Facility management
EN 15221 – 2, Part 2	FM agreements
EN 15221 – 3, Part 3	Guidance how to achieve/ensure quality in facility management
EN 15221 – 4, Part 4	Classification and structures
EN 15221 – 5, Part 5	Guidance on the development and improvement of processes
EN 15221 – 6, Part 6	Area and space measurement

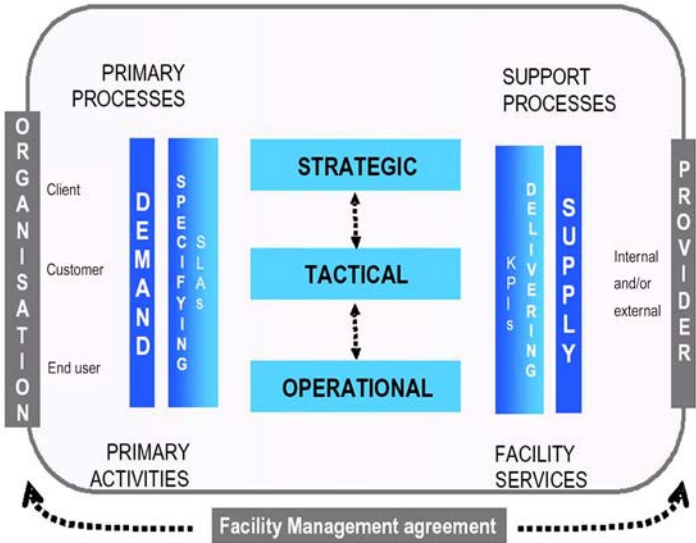


Figure 1.
The European FM model

Source: EuroFM (2011)

external services”, in relation to the gross domestic product (GDP). With such a large figure, FM has grown to become the largest business service market in Europe – a young yet an important player.

Table IV provides an overview of the UK, Germany, The Netherlands and Portugal as researched by Teichmann. Only these four countries are listed as they either have a large FM market (the UK and Germany) or have many years of experience (The Netherlands) when it comes to FM education – see section FM education. Obviously, Portugal is listed as “case study”. The table shows the national market size expressed in Euro’s and percentages of their market share. The relation of the countries mentioned in the table to the research is that those countries have a large FM market and are experienced when it comes to FM education.

The total of expenditure of the total of 41 countries as researched by Teichmann is €655.13. The above-mentioned countries are responsible for €311.32 which is 47.52 per cent. The reason why organisations invest in professional FM services is due to the market’s increasing need of costs efficiency, higher customer satisfaction and proper building maintenance and safety. In fact the FM professionals are “dedicated to ensuring that their facilities are operated and maintained safely, efficiently and cost-effectively”.

Facility management education

There are several requirements that study programmes have to meet. One of them is the Bologna declaration. Since June 19 1999, European countries are subject to the Bologna (Italy) declaration; a joint declaration of the European Ministers of Education.

After a higher education institution has gained an accreditation it is expected to “maintain and demonstrate this commitment to regular improvement within their own programmes over the duration of each accreditation period”. “Accreditation is the act of granting credit or recognition (especially with respect to an educational institution that maintains suitable standards) “. A large association that provides FM accreditation is the IFMA; the IFMA Foundation Accredited Degree Programme. Moreover, the European FM Education Guide was published in 2009 to “create a reference publication which incorporates all relevant information for students, educators, associations and practitioners regarding existing Real Estate and FM education programmes across Europe”.

Aside from being accredited by the Bologna treaty, the FM study programme could also be accredited by the IFMA because of its high international standard. IFMA has 11 core competences in the accreditation programme. These are:

- (1) communication;
- (2) emergency preparedness;

Ranking on Teichmann’s list	Country	Market size (€, billions)	Market size (per cent)
1	UK	204.39	31.20
2	Germany	73.38	11.20
7	The Netherlands	25.93	3.96
19	Portugal	7.62	1.16

Source: Teichmann (2009)

Table IV.
FM market size per
selected country

- (3) environmental stewardship and sustainability;
- (4) finance and business;
- (5) human factors;
- (6) leadership and strategy;
- (7) operations and maintenance;
- (8) project management;
- (9) quality;
- (10) real estate and property management; and
- (11) technology.

The IFMA also has another chapter in their accreditation programme in which ten objectives are central to a FM programme.

Outlined below are substantial facts on FM education throughout Europe:

- (1) 15 European countries offer a total of 49 FM and FM related study programmes.
- (2) Programmes are accredited by IFMA or other national FM associations.
- (3) Those 49 programmes are taught divided over 42 institutions and are represented in the following countries:
 - The Netherlands is responsible for 13 programmes at 12 institutions.
 - Germany is responsible for seven programmes at seven institutions.
 - Norway is responsible for six programmes at four institutions.
 - The UK and Finland both have three programmes at three institutions.
 - Austria is responsible for five programmes at three institutions.

The FM and FM related study programmes that are taught in the abovementioned institutions are illustrated in Figure 2.

The Portuguese facility management market

Organisations in Portugal are familiar with the field of FM. Contrary to what is stated in theory; organisations situated in Portugal are structured as such that the three

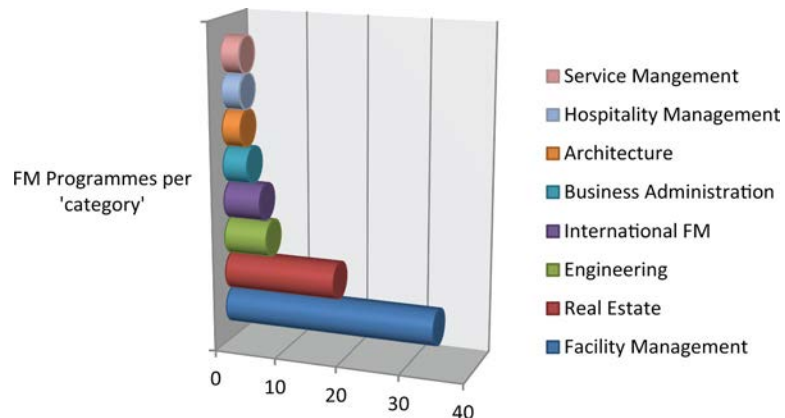


Figure 2.
FM and FM related study
programmes

“pillars” of FM are separated. This leads to long communication lines and misplacement of FM standards. Meaning, the true added value of FM - cost efficiency, short communication lines, higher customer satisfaction, proper building maintenance and safety - does not bring great benefits to organisations in Portugal. Also, research shows that Portuguese organisations place more emphasis on technical skills when it comes to FM, rather than managerial.

Future development

Trends inform on any possible development within the market; facility managers are required to be able to “predict” these kinds of developments and trends as stated by LOOFD. Dawson, past chairman of IFMA (2004-2005) stated that “they are what we need to be thinking about to prepare ourselves for the future”. The most common and noticed trends within the field of FM in an international context over the next five years (Cotts *et al.*, 2010; Ernst & Young, 2010; IFMA, 2007; LOOFD, 2011):

- Expanded viewpoint of a business leader from client focus to client experience focus and linking FM to strategy.
- Emergency preparedness.
- Change management.
- Sustainability and socially responsible service provision.
- Emerging technology.
- Globalisation and increasing importance of internationalisation.
- Broadening diversity in the workforce.
- Aging buildings and integration of development and management of real estate.

It is important to note that the recession has an impact on the size of FM and its market. The financial crisis in 2007 was expected to last until 2012 and the impact already had an enormous influence, such as cost reductions in FM organisations (standardising services, better contract deals with providers etcetera), more efficient use of square meters and also the bankruptcy of companies. Nevertheless, research shows that FM is an important player in the European market and is one of the largest service providers. According to the current flow of development of FM, this field is expected to continue to develop over the course of time.

5. Results and discussion

The FM market in Portugal needs a boost in terms of recognition, education, and awareness. However, due to the country’s unfavourable economic situation this is rather complicated to change. When looking at the Portuguese market, it can be stated that the economy is in need of many aspects: more employment opportunities, cost reduction, clear organisational structure and increase of the educational programmes for professionals and future facility managers. For that reason, implementing FM can be identified as a need because FM brings many benefits such as: cost efficiency, higher customer satisfaction, proper building maintenance and safety. Not to mention, employment opportunities arising from FM are abundant. These aspects are in line with the need of the current economy and will give the field of FM a proverbial boost in Portugal.

Three GAP’s are identified to exemplify the “desired state of performance compared with the current state of performance”:

- (1) *The Portuguese market versus the European market.* Research on FM trends and the future prospect of FM showed that FM is operating on a strategic level in Europe, whereas in Portugal, FM is mainly functioning on tactical level. This is due to the low recognition and awareness of FM in Portugal.
- (2) *Theory versus practice.* Research showed that FM can take on different shapes (either technical or service oriented) depending on the country and the core business. Nevertheless, they are all in line with FM theory (place, people, and process). In Portugal, however, FM is organised as such that it is a lot more technical, thus lacking the managerial and people elements. Plus, it is not in line with the EN 15221 standard simply because departments are not recognised or labelled as FM departments.
- (3) *Development of a FM education versus the market of FM in Portugal.* Due to the FM market within Portugal, which is small – economically speaking – and Portugal's needs for FM education, the implementation of a FM study programme could be a lengthy process.

The semi-structured qualitative interviews shed light on the profession of FM within Portugal. It shows that in Portuguese organisations, technical operations, maintenance manager, and real estate are departments that are often referred to as the FM department. This indicates that in Portugal FM is a hard skill rather than a soft skill and is therefore more technical. The reason behind this was that research showed a difference between the European and the Portuguese participants: those facility managers of Portuguese origin were trained engineers and architects with no education in FM. Whereas, European facility managers have the educational background of a FM degree. Clearly, as much as technical knowledge is indispensable in the field of FM, a soft approach with a managerial twist is lacking among the Portuguese facility managers.

Interestingly, due to FM being so focused on hard services, Portuguese professionals recognised the importance of the soft services within FM, which they found lacking in today's Portuguese industry. Furthermore, all interviewees agree with FM being of a supportive nature, where SLA's, services, customer satisfaction and people are mentioned as important (f)actors of FM. However, the interviews also showed that 75 per cent mentioned the word "Place" when it comes to defining FM in Portugal, whereas "People" and "Processes" were left out. This is contrary to the definition of FM, as defined in the EN 15221, which focuses on the three pillars as being mutually exclusive. One could say that FM in Portugal should strive to be in line with the European standard of FM to reach maximum efficiency while decreasing costs and incorporating hard and soft skills.

Fundamentally, all Portuguese professionals agreed that a full-time FM study programme in Portugal must incorporate both the hard as well as the soft services to educate aspiring Facility Managers. They indicated that, in order to create high qualified future facility managers, the "Integration of processes within an organisation to maintain and develop the agreed services which support and improve the effectiveness of its primary activities" is necessary. In addition, the programme should also include the field of hospitality, the importance of innovation, and an emphasis on the future development of FM.

On a larger scale, European respondents found services such as catering, security, cleaning, real estate and workplace management as those closely related to FM. Hence, the questionnaire also revealed that the following courses are vital to the study

programme: services (catering, security, cleaning), real estate, workplace management and human resource management (HRM). These courses have both the hard (technical) and the soft (managerial) elements of FM which was the advice of all the professionals interviewed.

6. Recommendation and conclusion

To recall, the research question is “How can the APFM best support the Portuguese market’s need, by implementing a facility management study programme?” Research suggests that a FM study programme should be implemented in clearly defined and distinct phases. These phases run from creating awareness of the importance of FM in the Portuguese market to the implementation of a solid full-time Bachelor and Master FM degree. Table V shows the initial phases that Portuguese universities should aim at completing.

Essentially, the current Portuguese facility managers have an in-depth knowledge of the technical part of FM. This means that the focus should be placed on providing a

Phase	Activity	External party/ source	Relation to FM education	Requirements of FM education
1	General set up of study programme	Bologna Declaration	European educational system, Portugal is subject to this declaration	Three levels of study: License (Bachelor), Master, PhD Credit systems (ECTS) Two main cycles — undergraduate and graduate Mobility amongst students within Europe Quality
2	Portuguese set up of a study programme	Direcção-Geral do Ensino Superior	Portuguese legislation for higher education	License degree = 180/240 ECTS = 3 or 4 years of study Master degree = 90/120/360 ECTS = 1, 5 or 2 or 6 years of study PhD degree = 180 ECTS = 3 years of study
3	Basic needs of FM study programme	IFMA accreditation	Accreditation of the FM education → certificate for degreed facility managers	Focus on 11 competences
4	European FM standard	EN 15221	European Standard for FM	Acceptance of terms and definitions, FM agreements, quality, classification and structure, development and improvement of processes and area and space management within FM

Table V.
Phases of
recommendations of FM
education in Portugal

part-time study programme to develop their managerial as well as soft skills necessary for FM. Through this, FM will become more popular in organisations, thus increasing the need for certified facility managers. This, in turn, will generate the required population interested in pursuing a complete and full-time FM Bachelor or Master. It is important to note that the transition of these phases demands time and research invested in by major Portuguese universities.

Therefore, the main answer to the research question is to support the FM market by providing current FM professionals in Portugal with courses focused on soft services in a managerial direction in line with FM theory. Also, courses should cover the FM fundamentals such as the EN 15221. This knowledge will be brought into practice by those professionals and therefore increase the awareness of FM in the Portuguese market and society.

References

- CEN (2006), EN15221-1: 2006 Facility Management – Part 1: Terms and definitions, CEN, Brussels.
- Cotts, D.G., Roper, K.O. and Payant, R.P. (2010), *The Facility Management Handbook*, AMACOM, New York, NY, available at: http://books.google.com/books?id=1V_LpuvDMBoC&pg=PA417&dq=cotts+and+lee,+the+facility+management+handbook&hl=nl&ei=9TyCTe_vBYf24AaZlqWMCQ&sa=X&oi=book_result&ct=result&resnum=1&ved=0CCwQ6AEwAA#v=onepage&q=definition&f=false (accessed 17 March 2011).
- Ernst & Young (2010), *Eurozone Forecast, United Kingdom*, Ernst & Young.
- EuroFM (2011), available at: <http://eurofm.org/about-us/what-is-fm/> (accessed 16 March 2011).
- IFMA-IT1 (2011), available at: <http://ifma.com/about/> (accessed 3 March 2011).
- IFMA (2007), *Exploring the Current Trends and Future Outlook for Facility Management Professionals*, IFMA, Houston, TX.
- Johnson, R., Onwuegbuzie, A. and Turner, L. (2007), "Toward a definition of mixed methods research", *Journal of Mixed Methods Research*, Vol. 1 No. 2, pp. 112-133.
- LOOFD (2011), *The Facility Manager, The Competent Professional*, LOOFD, The Netherlands.
- Maas, G. and Pleunis, J. (2006), *Facility Management, Strategie en Bedrijfsvoering van de Facilitaire Organisatie*, Kluwer, Alphen aan den Rijn.
- Teichmann, S. (2009), "FM market size in Europe", *EuropeanFM insight*, pp. 5-7.

Further reading

- Alexander, K. (2009), "European facilities management futures", *European FM Insight*, p. 10.
- AMBA (2011), www.mbaworld.com, available at: www.mbaworld.com/administrator/file_sys/uploaded_files/1299681060-MBA%20critieria_web.pdf (accessed 1 April 2011).
- APFM (2011), available at: www.apfm.pt/page/missao-objetivos/ (accessed 2 March 2011).
- APFM (2012), September 20, available at: <http://apfm.pt/>
- Corkill, D. (1993), *The Portuguese Economy Since 1974*, Edinburgh University Press, Edinburgh.
- Council of Europe (1997), Convention on the Recognition of Qualifications Concerning Higher Education in the European Region, April 11, available at: <http://conventions.coe.int/Treaty/Commun/QueVoulezVous.asp?NT=165&CM=1&DF=15/04/&CL=ENG> (accessed 15 April 2011).

-
- EuroFM (2009), *European FM Education Guide*, EuroFM and NHTV University of Applied Science and Facilitec S.A., Naarden.
- EuroFM-IT1 (2011), available at: <http://eurofm.org/about-us/what-is-fm/> (accessed 16 March 2011).
- European Commission (2010), Communication from the Commission, 5 November, European Commission, Brussels, available at: <http://eur-lex.europa.eu/LexUriServ/LexUriServ.do?uri=COM:2010:0632:FIN:EN:PDF#page=2> (accessed 11 April 2011).
- European Union (1999), 19 June, available at: www.bologna-bergen2005.no/Docs/00-Main_doc/990719BOLOGNA_DECLARATION.PDF (accessed 30 March 2011).
- European Union (2010), *Europe 2020, A European Strategy For Smart, Sustainable and Inclusive Growth*, European Union, Brussels.
- Gijsbert, E. *et al.* (2010), *De Nederlandse Facility Management Markt*, FMN, Naarden.
- Grit, R. (2008), *Project Management, A Practical Approach*, Noordhoff Uitgevers BV, Groningen/Houten.
- Hanze University of Applied Sciences (2012), 20 September, available at: www.hanze.nl/home/International/Schools/School+of+Facility+Management/
- Huis, M. (2011), *Trendwatching 2010 &.. The Netherlands: Code 06*.
- IFMA Foundation (2011), available at: www.ifmafoundation.org/scholarships/degree.cfm (accessed 1 April 2011).
- IST (2012), 20 September, available at: www.ist.utl.pt/en/
- Jensen, P. (2010), *Facilities Management an Added Value: An EuroFM Research Initiative*.
- Keizer, J. and Kempen, P. (2006), *Business Research Projects*, Butterworth-Heinemann, Oxford.
- Keuning, D. (2006), *Management, a European perspective*, Wolters-Noordhoff, Groningen/Houten.
- Lewis, B. and Payant, R. (2007), *Facility Manager's Maintenance Handbook*, McGraw-Hill, New York, NY.
- Management Study Guide (2011), available at: www.managementstudyguide.com/management_levels.htm (accessed 22 March 2011).
- Ministério da Ciencia, Tecnologia e Ensino Superios (2006), available at: <http://dre.pt/pdf1sdip/2006/03/060A00/22422257.pdf> (accessed 20 May 2011).
- Ministério da Educacao (2005), available at: <http://dre.pt/pdf2sdip/2005/05/09100000/0736907371.pdf> (accessed 20 May 2011).
- Ministerio da Economia, da Inovacao e do Desenvolvimento (2011), 11 April, available at: www.ipq.pt/backhtmlfiles/ipq_mei.htm (accessed 12 April 2011).
- Steenhuizen, D. (2011), *A Portuguese Road; the Road to Facility Management*, D.C.Steenhuizen, Lisbon.
- United Nations, Development Policy and Analysis Division (1982-1990), available at: www.un.org/en/development/desa/policy/wess/archive.shtml (accessed 18 March 2011).