The Extended Enterprise Coherence-governance Assessment*

Roel Wagter[1,3], Hend*erik* A. Proper[2,3] and Dirk Witte[4]

[1] Ordina, Nieuwegein, the Netherlands
[2] CRP Henri Tudor, Luxembourg
[3] Radboud University Nijmegen, Nijmegen, the Netherlands
[4] Logica, Amstelveen, the Netherlands
roel.wagter@ordina.nl, erik.proper@tudor.lu, dirk.witte@logica.com

The Enterprise Coherence-governance Assessment (ECA) instrument is a part of the GEA (General Enterprise Architecting) method for enterprise architecture. Based on experiences with this assessment instrument in a range of real world projects, the ECA has been improved, leading to the *extended* Enterprise Coherence-governance Assessment (*e*ECA). So far, the *e*ECA been applied in 54 organizations with a total of 120 respondents. The paper discusses the context in which the *e*ECA instrument was developed, the instrument itself, as well as the results of the assessment study in which the instrument was applied.

The ECA and *e*ECA use the term 'coherence' rather than the more common term 'Business-IT alignment', since the latter is generally associated with bringing only 'Business' and 'IT' inline. The word coherence, however, stresses the need to go beyond this. Enterprise coherence involves connections and synchronisation between *all* important aspects of an enterprise. 'IT' and 'Business' just being two of these aspects.

Key words: business-IT alignment, enterprise coherence-governance assessment, enterprise architecture, enterprise architecture maturity model, enterprise coherence framework

1 Introduction

As reported on in earlier work [27, 28], the Enterprise Coherence-governance Assessment (ECA) is an instrument that enables organizations to assess their ability (maturity) to effectively govern their *enterprise coherence*, where *enterprise coherence* is understood to be:

> *The extent to which all relevant aspects of an enterprise are connected, to the extend necessary to let the enterprise meet its desired results.*

The *relevant aspects* in the above definition are organization dependent. Even more, the clarity with which an organization has articulated these aspects is one of the parameters

* This work has been partially sponsored by the *Fonds National de la Recherche Luxembourg* (www.fnr.lu), via the PEARL programme.

determining their ability/maturity to govern enterprise coherence. In [28] we have discussed the concept of the (organization specific) *coherence dashboard*, which enables organizations to precisely express the relevant aspects that need to be connected.

As argued in [27, 28], and demonstrated in terms of a report on a real world case in [29], enterprise coherence involves more than aligning 'Business' and 'IT'. Enterprise coherence involves connections and synchronisation between *all* important aspects of an enterprise. 'IT' and 'Business' just being two of these aspects. Other (practise oriented) sources also explicitly acknowledge the need for enterprise architecture methods to look well beyond the traditional Business-to-IT stack. Consider for example: [9, 12, 7].

The ECA is part of the GEA (General Enterprise Architecting) method for enterprise architecture. The development of GEA was initiated in 2006 by the consultancy firm Ordina (`www.ordina.nl`) as a multi-client[2] research project. The decision by Ordina to embark on the development of the GEA method originated from the observation that large scale enterprise transformations fail more often than not, while, in their experience, existing methods and frameworks for enterprise architecture failed to contribute to the success of enterprise transformation efforts [26, 25]. Furthermore, a survey held at the start of the GEA research programme, showed that the experience was not limited to Ordina alone, but was equally shared among a broad range of client organizations participating in the programme. The underlying issues were also considered grave enough for the participating client organizations to indeed co-invest in the programme in terms of time and money, in the GEA research programme. The initial survey also resulted in the driving hypothesis of the GEA programme: *the overall performance of an enterprise is positively influenced by a strong coherence among the key aspects of the enterprise, including business processes, organizational culture, product portfolio, human resources, information systems, IT support, etc.*

A first step in the GEA programme was the the development of (the first version of) an Enterprise Coherence-governance Assessment (ECA) [27] instrument to obtain a clearer understanding of the challenges to enterprise coherence, and its potential impact on organizational performance. This assessment was consequently applied at the participating client organizations. Based on the outcomes of these ECA studies the GEA research programme focussed its efforts on four research objectives:

1. *Definition of the indicators and factors influencing/defining enterprise coherence.*
2. *Identification of the impact of enterprise coherence on organizational performance.*
3. *An instrument to assess an enterprise's level of coherence.*
4. *Instruments to guard/improve the level of coherence in enterprises.*

In its current form, the GEA method comprises three core ingredients [25]. Next to the Enterprise Coherence-governance Assessment (ECA) [27] that allows organi-

[2] During different stages of the GEA research programme, the members of the programme included: ABN AMRO; ANWB; Achmea; Belastingdienst – Centrum voor ICT ICTU; ING; Kappa Holding; Ministerie van Binnenlandse Zaken en Koninkrijksrelaties; Ministerie van Defensie; Ministerie van Justitie – Dienst Justitiële Inrichtingen; Ministerie van LNV – Dienst Regelingen; Ministerie van Landbouw, Natuur en Voedselkwaliteit; Nederlandse Spoorwegen; Ordina; PGGM; Politie Nederland; Prorail; Provincie Flevoland; Rabobank; Radboud University Nijmegen; Rijkswaterstaat; UWV; Wehkamp.

zations to assess their ability to govern coherence during enterprise transformation, it contains an Enterprise Coherence Framework (ECF) [28] and a (situational) Enterprise Coherence Governance (ECG) [25] approach. The latter includes the identification of specific deliverables/results to be produced, the processes needed to produce these deliverables/results, as well as an articulation of the responsibilities and competences of the people involved. The ECF enables enterprises to set up their own *coherence dashboard*. This, enterprise specific, dashboard enables senior management to govern the coherence between key aspects of an enterprise during transformations.

As already identified in [27], there was a need to extend future versions of the ECA with a.o. characteristics from additional sources, including IT Architecture Capability Maturity Model [6], the Normalized Architecture Organization Maturity Index (NAOMI) [19], the Enterprise Architecture Score Card [21] and the NASCIO Enterprise Architecture Maturity Model [1]. Next to that, practical experiences in using the ECA is client projects, also produced feedback that called for an update/extension of the original ECA. This paper reports on the resulting new version of the ECA, the *extended Enterprise Coherence-governance Assessment* (*e*ECA).

The remainder of this paper is structured as follows. In Section 2 we briefly explain two other parts of the GEA method that are relevant to the discussions in this paper. More specifically, this involves the Enterprise Coherence Framework (ECF) and the Enterprise Coherence Governance (ECG) approach. In Section 3 then we continue with the presentation of the current version of the *e*ECA instrument. Before concluding, Section 4 continues with a report on the application of the instrument in the context of 54 large Dutch organizations with a total of 120 respondents.

2 Relevant elements of the GEA method

In this section, we briefly summarize the ECF and ECG parts of the GEA method. They will be used as a basis for our discussion of the *e*ECA.

2.1 The Enterprise Coherence Framework

The ECF (Enterprise Coherence Framework) [28] defines a series of cohesive elements and cohesive relationships, which together define the playing field for an enterprise's cohesion. By making the definition of these elements explicit in a specific enterprise, one gains insight in the 'state of cohesion' while also being able to assess the impact of potential transformations. This then enables a deliberate governance of enterprise coherence in terms of an organization specific *coherence dashboard* (also making the organization specific 'relevant aspects', that make up enterprise coherence, explicit). The ECF is defined in terms of two levels and their connections: the level of *purpose* and the level of *design*. At the level of purpose, the following cohesive elements have been identified, which are based on commonly known concepts from strategy formulation [15, 4, 3]:

Mission – a brief, typically one sentence, statement that defines the fundamental purpose of the organization that is enduringly pursued but never fulfilled.

Vision – a concise statement that defines the mid to long-term goals of an organization.
Core values – defines the desired behaviour, character and culture of an organization.
Goals – the visions quantified success factors, which become the reference points to judge the feasibility of strategies.
Strategy – forms a comprehensive master plan stating how the corporation will achieve its mission and goals.

The presence of a well documented enterprise mission, vision, core values, goals and strategy are preconditions to be able to determine the content of the core factors on the design level of the organization and they are the essential resources for this determination. The cohesive elements at the design level are:

Perspective – an angle from which one wishes to govern/steer/influence enterprise transformations. The set of perspectives used in a specific enterprise depend very much on its formal and informal power structures. Both internally, and externally. Typical examples are culture, customer, products/services, business processes, information provision, finance, value chain, corporate governance, etc. In GEA's view, it are really these perspectives that need to be aligned, in order to achieve enterprise coherence on the design level.
Core concept – a concept, within a perspective, that plays a key role in governing the organization from that perspective. Examples of core concepts within the perspective Finance are, for instance, "Financing" and "Budgeting".
Guiding statement – an internally agreed and published statement, which directs desirable behaviour. They only have to express a desire and/or give direction. Guiding statements may therefore cover policy statements, (normative) principles [10] and objectives.
Core model – a high level view of a perspective, based on, and in line with, the guiding statements of the corresponding perspective.
Relevant relationship – a description of the connection between two guiding statements of different perspectives.

The cohesive elements and their relationships are illustrated in Figure 1.

GEA' concept of *perspective* is related to the notion of *viewpoint* as defined in architecture standards such as TOGAF [23] and the IEEE definition of architecture [22]. The two notions are, however, not equal. A perspective is an angle from which one wants to *govern* enterprise transformations. Given a this desire to govern transformations from a certain angle, a viewpoint can be defined that captures the way one wants to view/contemplate from this angle. As such, one might say that GEA's notion of *perspectives* could be defined as *transformation-governance viewpoints*.

The set of perspectives used by a specific enterprise on its *coherence dashboard* is highly organization specific. This set is not likely correspond to the cells of well known design frameworks such as Zachman [32] or TOGAF's content framework [23]. Such frameworks, however, can indeed play an important role in the development of the core models within the different perspectives. Based on their respective underlying "design philosophies", these more design/engineering oriented frameworks provide a way (1) to ensure completeness and consistency from an engineering point of view, (2) to enforce/invite a specific line of reasoning on the design/construction of the enterprise and

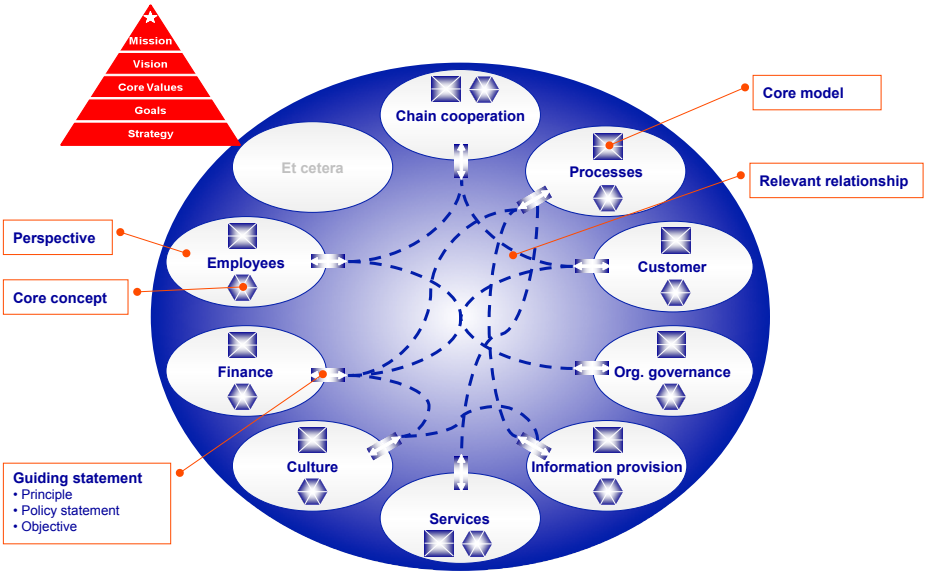

Fig. 1. The Enterprise Coherence Framework

(3) to classify/structure the different core models. In the creation of the latter models, modelling languages such as ArchiMate [13], e3Value [8], BPMN [16], or UML [17] can be used.

2.2 Enterprise Coherence Governance

As reported in [28], at the start of the GEA programme 31 requirements were formulated that should we met by the GEA method. The ECA [27] and ECF [28] only partly covered those requirements. Additional method components were needed, in particular a process to for enterprise coherence governance, the ECG. Collectively, the ECA, ECF and ECG method components cover the GEA concepts as depicted in Figure 2, where one concept builds on the other leading to a coherent whole. All the promises of the EA-vision, such as improving the coherence of the organization, should be achieved through the execution of EA-processes. The execution of the EA-processes results in EA-products that will direct change programmes and via this the enterprise coherence. EA-people are needed to carry out the EA-processes and to produce the EA-products. The EA-people need, to execute the EA-processes, allocation of means in terms of time, budgets and tools. The EA-people and the execution of EA-processes need to be governed by EA-governance. And finally to store a maintainable formal description of the formulation of the EA-Vision, EA-processes, EA-products, EA-people and EA-governance there is need for an EA-methodology. The ECG binds all these concepts together in a workable procedure for doing enterprise architecture [30, 25].

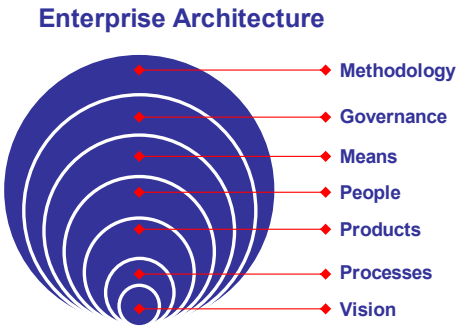

Fig. 2. Coherent set of GEA concepts

3 The extended Enterprise Coherence-governance Assessment

The original ECA [27] was based on the original requirements on the GEA method. The *e*ECA is based on the experiences gained from the development of the additional GEA components (ECF and ECG), as well as practical experiences in using the ECA and the GEA components in client engagements. See for example [29]. We also used additional sources to derive characteristics to assess an enterprise's coherence, e.g. from the Architecture Maturity Model embedded in the Dynamic Enterprise Architecture (DYA) method [31], the IT Architecture Capability Maturity Model [6], the Normalized Architecture Organization Maturity Index (NAOMI) [19], the Enterprise Architecture Score Card [20], and the NASCIO Enterprise Architecture Maturity Model [1].

A problem with the existing architecture maturity models, is that they have a traditional business-IT alignment focus. In our view the cause of this is that existing enterprise architecture approaches and frameworks, such as Zachman [32], DYA [31], Abcouwer et al. [2], Henderson & Venkatraman [11], TOGAF [23], IAF [24] and ArchiMate [14], take an "engineering oriented" style of communicating with senior management and stakeholders in general. The architecture frameworks underlying each of these approaches are very much driven by "engineering principles", and as such correspond to a Blue-print style of thinking about change [5]. The requirements on the GEA method, however, suggested the need to use another style of thinking. More in terms of stakeholder interests, formal and informal power structures within enterprises, and the associated processes of creating win-win situations and forming coalitions. In terms of De Caluwé [5], this is more the Yellow-print style of thinking about change. In the GEA programme, the Yellow-print line of thinking was taken as a starting point rather than the Blue-print line of thinking. This was done by taking the perspective that the actual social forces and associated strategic dialogues within an enterprise should be taken as a starting point, rather than the frameworks of existing architecture approaches suggesting the full make ability of an organization. This is also the reason why (see Section 2) GEA's enterprise architecture framework does not have an a priori defined set of perspectives. The relevant set of perspectives is highly organization dependent.

For this reason we have adopted the maturity levels used in the aforementioned architecture maturity models, but as aspects on which the maturity level should be deter-

mined we use the GEA components, including the requirements and cohesive elements which these components are based on. The *e*ECA developed by the members of the innovation programme GEA consists of three interrelated parts. See Figure 3.

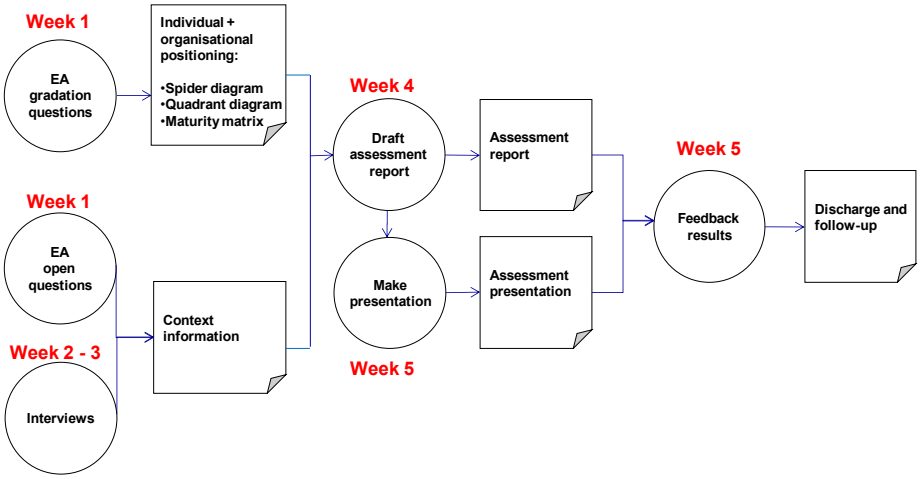

Fig. 3. Application of the *e*ECA (processes and products)

These parts consists of a set of fifty gradation questions (see ++++ Appendix 1), a set of twenty three open questions (see +++ Appendix 2) and an interview based on these questions. To conduct these 3 parts including the following reporting activities takes a turnaround time of approximately 5 weeks by a given number of about 25 respondents. Each of the gradation questions must be answered by one of the following gradations: '*not at all*', '*minor*', '*sufficient*', '*largely*', '*entirely*', '*do not know*'. By choosing the latter possibility the appropriate question does not count in the calculations to determine the maturity level.

The gradation questions result in three types of reporting: a '*spider diagram*', a '*quadrant diagram*' and a '*maturity matrix*' both on individual level and on organizational level. The answers on the open questions provide the necessary context information. Also include the open questions a number of cross-reference questions with respect to the gradation questions. After receiving the answers on the gradation questions and the open questions the interviews are planned. During the interviews the interviewer can ask more detailed questions about the gradation and open questions, but may also ascertain things that respondents not initially want to write down. Through conducting the interview the interviewer completes the context information obtained through the open questions. First we discuss the above mentioned diagrams and maturity matrix.

3.1 Spider diagram

In the spider diagram, the answers to the 50 gradation questions are plotted on a four-point scale on the seven axes representing the seven GEA components. See Figure 4.

So one can quickly see how each of the maturity levels of the GEA components are measured and also the diagram gives an insight about the overall maturity level of the EA function. Is the shaded area in the spider diagram relatively small one can say that in the opinion of the respondent(s) the organization has not done enough to EA. The diagram would be completely shaded in case all the questions were answered with '*entirely*'.

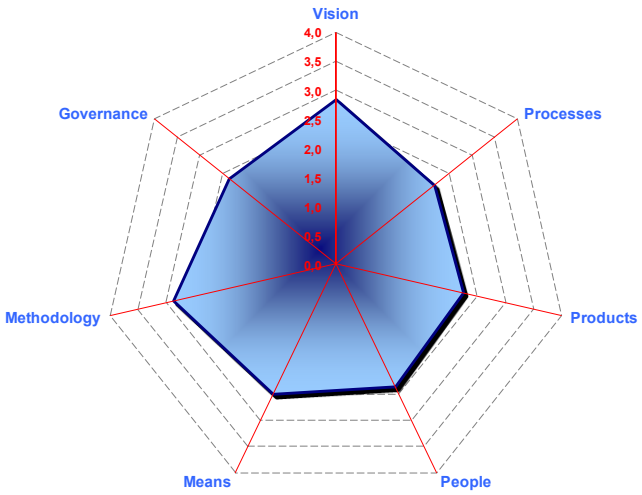

Fig. 4. Maturity score, of a single employee, on the seven GEA components

3.2 Quadrant diagram

The results of the answers to the fifty rating questions are reflected in a quadrant model, as depicted in Figure 5. This model is composed of two axes, the horizontal axis represents the level of development of the EA Vision and the vertical axis represents the level of the application of the EA Vision. These axes represent two dimensions of the governance of enterprise coherence, which correspond to the aforementioned GEA parts that need to be developed. Each quadrant has a lavel, characterizing the hypothetical (maturity) state of the enterprise as a function of the maturity of the EA function. In short, the scores are computed as follows:

$$S^{\text{development}} \triangleq \sum_{i=1}^{7} W_i^{\text{development}} \,.\, C_i$$

$$S^{\text{application}} \triangleq \sum_{i=1}^{7} W_i^{\text{application}} \,.\, C_i$$

$$C_i \triangleq \sum_{j=1}^{50} w_{i,j}.Q_j$$

where:

$W^{\text{development}}$ is a vector expressing the relative weight of a GEA component towards the development of an EA vision.

$W^{\text{application}}$ is a vector expressing the relative weight of a GEA component towards the application of an EA vision.

w is a matrix expressing the relative contribution of a question to the score of a given GEA component.

Q is a vector expressing the score that was given to a specific question, ranging from 0 ('*not at all*') to 4 ('*entirely*').

The axis 'EA vision development' describes the extent to which an organization's body of knowledge concerning the governance of enterprise coherence has been made explicit, in particular the EA-vision and the EA-methodology. Is there a vision about enterprise architecting? Has the vision been translated into a methodology and how an organization wants to use it (is there an implementation plan)? Is there a real ambition for the application of EA? The axis 'EA vision application' describes the extent to which an organization actually operates the body of thought, in particular the EA-processes, the EA-products, the EA-means and the EA-governance. The correlation between the two axes results in four quadrants. Each quadrant has a label, characterizing the hypothetical state of the enterprise as a function of the maturity of the EA function. This is illustrated for one employee in Figure 5.

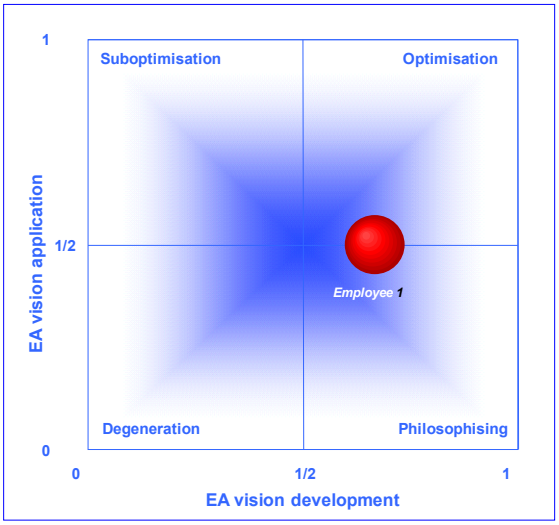

Fig. 5. Example individual (Employee$_1$) perception of the maturity of the EA function

Figure 6 provides a brief outline of the characteristics per quadrant. Below we will discuss the quadrants in more detail, while Table 1 provides anonymized real world examples of fifty-four organizations and their positioning in relation to the quadrants.

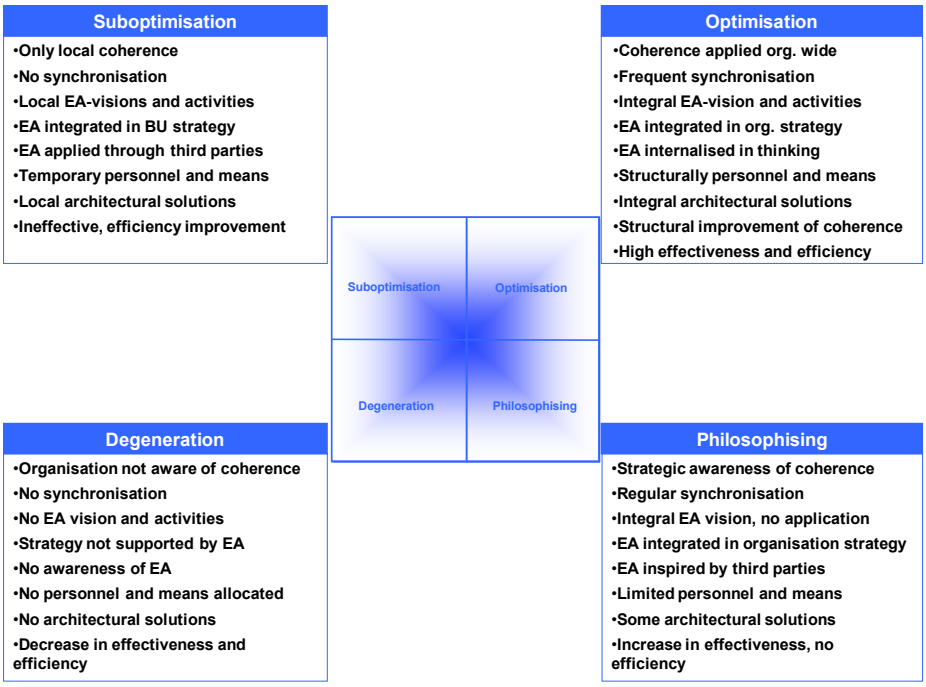

Fig. 6. Characteristics of organizations as a function of EA maturity

Degenerating quadrant If an organization has no vision about enterprise architecting and also does not know how to apply this form of management then the organization scores in this quadrant. Coherence in the organization will continue to degenerate with proportionate effects on the organization's performance. Characteristic aspects for this quadrant are:

- Coherence is not considered an important aspect.
- There is little or no synchronisation between representatives of the important aspects of the enterprise.
- No worth mentioning EA vision or activities.
- Strategy is not supported by EA.
- There is no awareness of EA.
- No people or resources are allocated to EA.
- Solutions are designed and implemented without architecture.
- Decrease in effectiveness and efficiency.

Philosophical quadrant There is a vision of enterprise architecting, this is also translated into how it should be implemented, but it is not developed beyond terms of 'paper' and 'goodwill'. It is not 'exploited', let alone implemented. There may be some basic increase in effectiveness. A basic level/awareness of governance of enterprise coher-

ence may be developed. Therefore, there is an increased likelihood that things move in 'the right direction'. Characteristic aspects for this quadrant are:

- Coherence is considered to be a strategic aspect throughout the organization.
- There is regular synchronisation between representatives of the important aspects of the enterprise.
- There is an integral EA vision, limited EA activities in the enterprise's operations.
- EA is integrated in the organization's strategy.
- EA is inspired especially by third parties.
- A limited number of people and resources has been allocated to EA.
- Some solutions are implemented with architecture.
- Increase in effectiveness, not in efficiency.

Suboptimal quadrant Organizations positioned in this quadrant are inhabited with do-ers, individuals with their own perception, belief and ideas about enterprise architecting, who have taken their own local actions. Models have been designed that perhaps offer the most potential for reinforcing governance of coherence throughout the organization. However, these are not synchronized/aligned and are formulated in their own jargon. The biggest flaw is that the managers, who should use these products in their decision making processes, do not know that they exist or they do not know how to understand and interpret them. A number of things are done well, but these are not good things by definition. Throughout the organization there is some increase in efficiency. Characteristic aspects of this quadrant are:

- Coherence is only experienced as an enterprise aspect locally and in different ways.
- There is no synchronisation between representatives of the important enterprise aspects.
- Local EA perceptions and interpretations and activities are on the agenda.
- EA is integrated in one or more department strategies.
- EA is applied particularly by third parties.
- Local and frequent temporary allocation of people and resources to EA.
- Local solutions are implemented with architecture.
- Not effective, increase in efficiency.

Optimization quadrant In this quadrant, vision and action go hand in hand. The organization has a clear understanding of enterprise architecting and knows how to use it to its advantage. The managers take strategic decisions from their integral and actual knowledge about the meaning and design of the organization. The organization works on optimising management and implementation processes that are supported by EA processes and products. The good things are done well, in other words efficiency and effectiveness go hand in hand. Characteristic aspects for this quadrant are:

- Coherence is experienced as an important aspect and governance of coherence is applied throughout the organization.
- There is frequent synchronisation between representatives of the important aspects of the enterprise.

- EA is used as a directional framework to guide decision making processes resulting in integral solutions addressing all important aspects of the enterprise on strategic, tactical and operational levels and aligning the interdependencies between them.
- EA is integrated in the organization's strategy.
- The notion of necessity of enterprise coherence is internalized in the thinking and action of its leaders and managers.
- People and resources are structurally assigned to the EA function.
- Integral solutions for major issues are implemented with architecture.
- Structural improvements in coherence within the organization is on the agenda.
- There is high effectiveness and efficiency.

When the questions from the questionnaire have been answered, then the respondents' scores offer a good starting point for follow up actions to improve the governance of enterprise coherence. In particular, by using the following questions as drivers:

- How can the (possible) differences in the positioning of the maturity of EA according to the respondents be explained?
- Which steps for improvement can be made in connection with the positioning on an aggregate level (average of the respondents' scores)?

The discussion arising from the first question may urge employees adjusting their views, which would have provided a very different score. Especially employees who are supposed to make use of EA products, but did not have the courage to do so, will find a platform to express their dissatisfaction. Or if not, it may lead to new concepts for the whole group. The organization's score is an average of the given scores from the individual respondents. However, as we will see in the next section, the average is not just computed, but rather determined in joined sessions with all the involved respondents. During such a session, individual respondents may change their scores in response to improved insights into their understanding of the actual situation in the organization and/or insight into the question itself. If the results of the organization's score are in the optimization quadrant then people will be reap the benefits of applying coherence governance. It is important to maintain this optimization and to stay alert so as not to fall back into old habits. In other words, a position in a quadrant is not a fixed state, but subject to constant change. More specific, you need to put a constant effort in keeping of improving the enterprise coherence otherwise it will gradually decline into a state of degeneration. If the positioning falls in one of the three following quadrants: degeneration, philosophising or sub-optimisation, then this offers greater possibilities for improvement. If the score falls in the degeneration quadrant this means that one must first take a step to the right as well as directly upwards, before the step can be made towards optimization (see Figure 7). These approaches correspond to organization's management styles. One organization may first want to consider it properly, as a supporter of the Design School and another organization may want to initiate experiments first, as a supporter of the Learning School [18].

3.3 Maturity matrix

The results of the answers of the fity rating questions are reflected in a weighted, not normalized score and showed in a maturity matrix, as depicted in Figure 8. This model

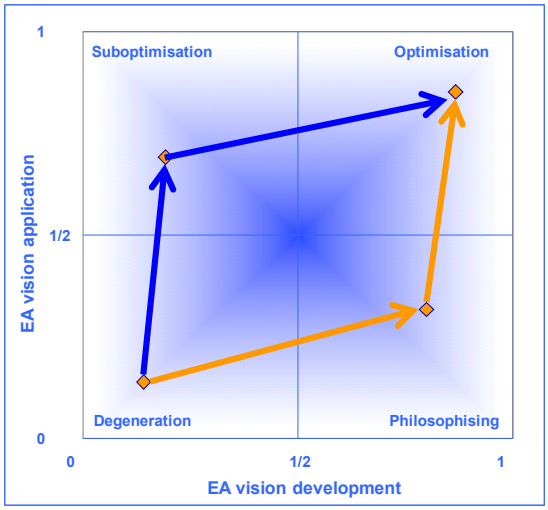

Fig. 7. EA maturity development scenarios

is composed of two axes, the horizontal axis represents the EA maturity levels and the vertical axis represents the set of GEA components. In the cells of appendix 3 'GEA Maturity Model@@ one will find the status of a GEA component on a certain maturity level as well as descriptions of on the axes presented maturity levels and GEA components. In practise, we plot the maturity scores of the GEA components as represented in Figure 8 on the figure as represented in appendix 3 ????? making the state of maturity in terms of the GEA components quickly visible.

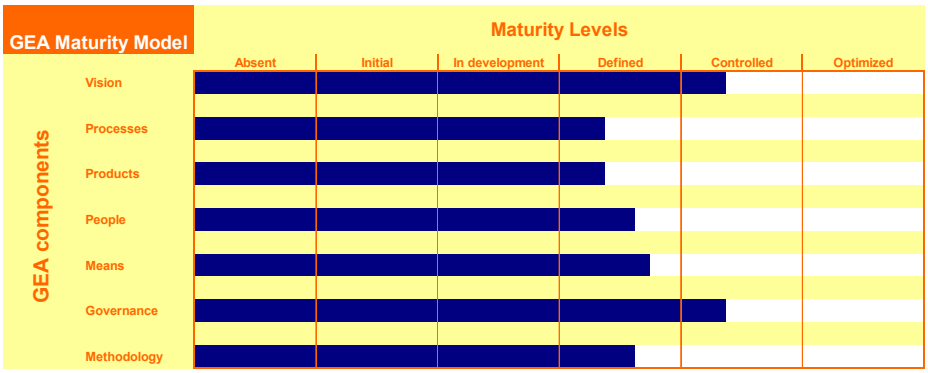

Fig. 8. Case illustration results *e*ECA plotted on the GEA Maturity Model

4 Results of the application of the *e*ECA

In 2011 we applied the *e*ECA with respect to the part of the grading questions in 54 organiza-tions with the participation of 120 respondents. We distinguished in this research four market sectors: Public, Finance, Industry and Rest. See Table 1 for the distribution of participating organizations per market and number of respondents.

Market sector	Number of organisations	Number of respondents
Public	16	64
Finance	17	29
Industry	7	7
Rest	14	20
Total	54	120

Table 1. Participants *e*ECA in 2011

In Figure 9 we show the results of the *e*ECA 2011 per market sector in a Spider Diagram. These diagrams provide the following insights. First all market sectors explores about the same efforts to enterprise coherence governance, in which the Finance sector scores a little higher. Compared to the other sectors the Finance sector scores, except for the component Means, for all GEA components on 1.5 points. Second, all market sectors do have a low score on enterprise coherence governance. If all the grading questions had been completed with 'entirely', the surfaces shown in Figure 9 would be fully shaded.

In Figure 10 we show the results of the *e*ECA 2011 per market sector on the GEA Quadrant Diagram. The numbered spheres in the quadrants represent the participating organizations. Figure 10 shows that 11.1% (6 of 54) of the organizations do have a score in the quadrant op-timisation. So 88.9% do not. A similar, but more limited study in [27], if less than 50% of the assessed organizations scores in the optimization quadrant. In that study we showed that 85.7% of the participants did not score in the optimization quadrant and that it clearly demonstrated the need for further research into the governance of enterprise coherence, in particular the development of a theory for the governance of enterprise coherence. With a similar score of 88.9% in our extended study of 2011, we confirm the aforementioned need.

In Figure 11 we show the results of the *e*ECA 2011 per market sector on the GEA Maturity Model. These maturity models provide the following insights. First, in all market sectors the GEA component 'Governance' scores lowest. Second, all market sectors are at the begin-ning of the maturity level 'In development@@ in which the market sector 'Finance' is most far.

5 Conclusion

In this article we explored the Extended Enterprise Coherence-governance Assessment (*e*ECA) instrument and the application of the *e*ECA in 54 organizations in the Nether-

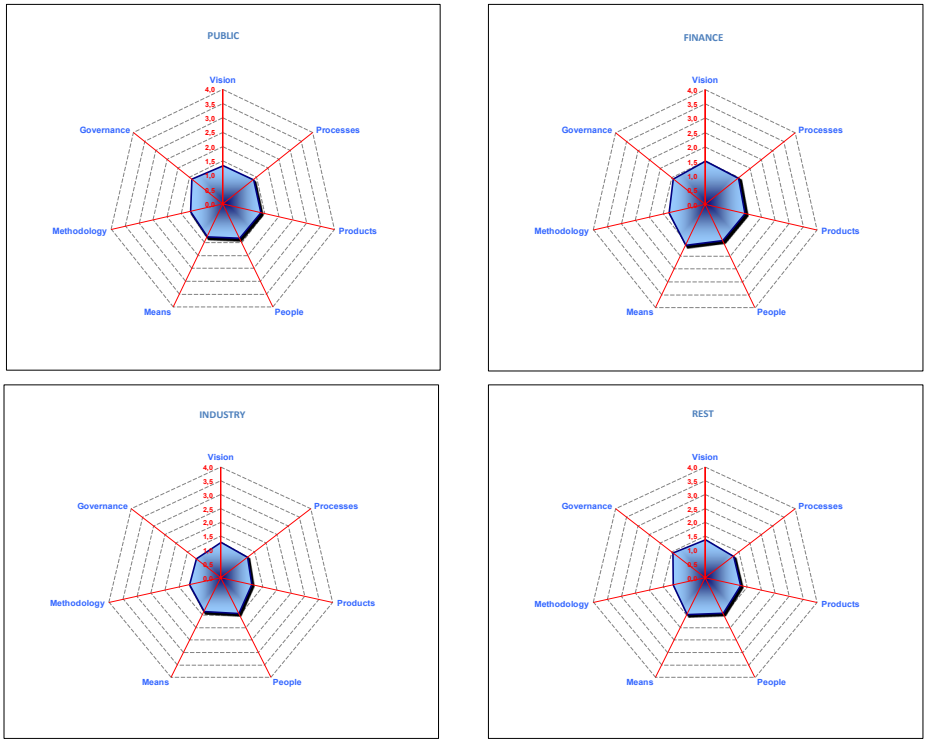

Fig. 9. Results of the *e*ECA 2011 plotted as spider diagrams

lands with 120 respondents in de market sectors Public, Finance, Industry and Rest. This instrument provides individual organizations with an important measure for positioning itself on a maturity scale, indicating the organization's ability to govern enterprise coherence. Also, it helps to provide the degree of maturity on the 7 components enterprise coherence governance consists of. Through this assessment, conducted in 2011, we have shown that 88.9% of the participating organizations lack enterprise coherence governance. Also we confirm with this assessment the result of a similar but more limited study carried out in 2007, which showed a corresponding percentage of 85.7%. Principles, design, procedure and backgrounds to the instrument were also discussed. The results of the assessment offer organizations useful arguments and insights for discussions, about the use of enterprise architecture as an instrument to achieve better governance of enterprise coherence.

References

1. Enterprise architecture maturity model version 1.3. Technical report, National Association of State Chief Information Officers (NASCIO), United States of America, 2003. `http://www.nascio.org/`

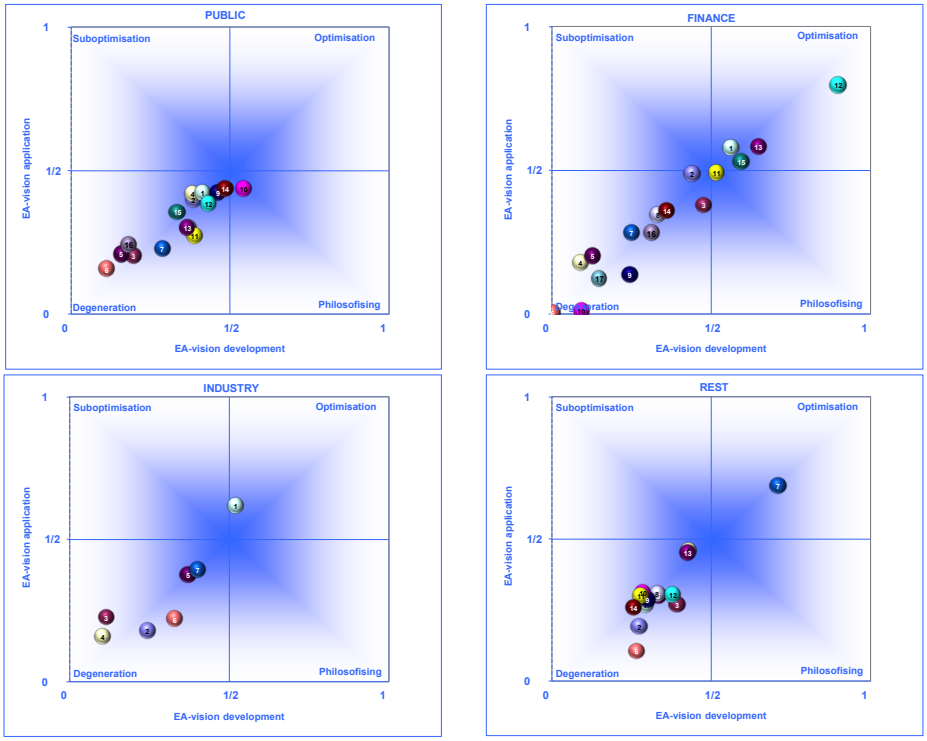

Fig. 10. Results of the *e*ECA 2011 plotted on the maturity quadrant diagram

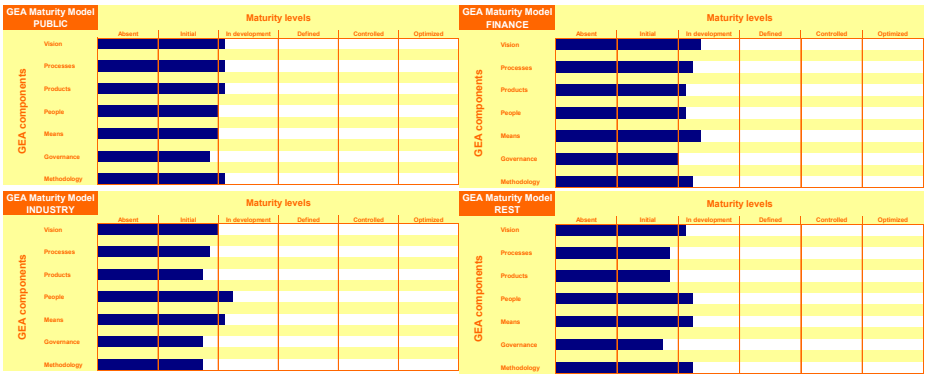

Fig. 11. Results of the *e*ECA 2011 plotted on the GEA maturity model

2. A. Abcouwer, R. Maes, and J. Truijens. Contouren van een generiek model voor informatiemanagement. Primavera working paper, Universiteit van Amsterdam, 1997. In Dutch.
3. A.D. Chandler. *Strategy and Structure, Chapters in the History of the American Industrial Enterprise*. The MIT Press, Cambridge, Massachusetts, 1969. ISBN-10: 0262530090
4. J. Collins and J. Porras. Building Your Company's Vision. *Harvard Business Review*, 1996.
5. L. De Caluwé and H. Vermaak. *Learning to Change: A Guide for Organization Change Agents*. Sage publications, London, United Kingdom, 2003. ISBN-10: 9014961587
6. Department of Commerce, Government of the USA. *Introduction - IT Architecture Capability Maturity Model*. Government of the United States of America, 2003.
7. L. Fehskens. Deriving Execution from Strategy: Architecture and the Enterprise. In *Open Group Conference Amsterdam*. The Open Group, October 2010.
8. J. Gordijn and H. Akkermans. Value based requirements engineering: Exploring innovative e-commerce ideas. *Requirements Engineering Journal*, 8(2):114–134, 2003. doi:10.1007/s00766-003-0169-x
9. T. Graves. *Real Enterprise Architecture: beyond IT to the whole enterprise*. Tetradian Books, Colchester, England, United Kingdom, 2008. ISBN-13: 9781906681005 http://tetradianbooks.com
10. D. Greefhorst and H.A. Proper. *Architecture Principles – The Cornerstones of Enterprise Architecture*. Enterprise Engineering Series. Springer, Berlin, Germany, 2011. ISBN-13: 9783642202780 http://www.springer.com/business+%26+management/business+information+systems/book/978-3-642-20278-0
11. J.C. Henderson and N. Venkatraman. Strategic alignment: Leveraging information technology for transforming organizations. *IBM Systems Journal*, 32(1):4–16, 1993.
12. J.A.P. Hoogervorst. *Enterprise Governance and Enterprise Engineering*. Springer, Berlin, Germany, 2009. ISBN-13: 9783540926702
13. M.-E. Iacob, H. Jonkers, M.M. Lankhorst, and H.A. Proper. *ArchiMate 1.0 Specification*. The Open Group, 2009. ISBN-13: 9789087535025
14. M.-E. Iacob, H. Jonkers, M.M. Lankhorst, H.A. Proper, and D.A.C. Quartel. *ArchiMate 2.0 Specification*. The Open Group, 2012. ISBN-10: 1937218003
15. R.S. Kaplan and D.P. Norton. *The Strategy-Focused Organization: How Balanced Scorecard Companies Thrive in the New Business Environment*. Harvard Business School Press, Boston, Massachusetts, 2000. ISBN-10: 1578512506
16. Object Management Group. Business process modeling notation, v1.1. OMG Available Specification OMG Document Number: formal/2008-01-17, January 2008.
17. OMG. UML 2.0 Superstructure Specification – Final Adopted Specification. Technical Report ptc/03–08–02, August 2003.
18. A. Pettigrew, H. Thomas, and R Whittington. *Handbook of Strategy & Management*. Sage Publications, 2001. ISBN-13: 9780761958932
19. B. van der Raadt, R. Slot, and H. Van Vliet. Experience Report: Assessing a Global Financial Services Company on its Enterprise Architecture Effectiveness Using NAOMI. pages 218b–218b, 2007. ISBN-10: 0769527558 doi:10.1109/HICSS.2007.217
20. J. Schekkerman. Enterprise Architecture Score Card. Technical report, Institute for Enterprise Architecture Developments, Amersfoort, The Netherlands, 2004.
21. J. Schekkerman. *How to Survive in the Jungle of Enterprise Architecture Frameworks: Creating or Choosing an Enterprise Architecture Framework*. Trafford Publishing, Victoria, British Columbia, Canada, 2006. ISBN-13: 9781412016070
22. The Architecture Working Group of the Software Engineering Committee. Recommended Practice for Architectural Description of Software Intensive Systems. Technical Report IEEE P1471:2000, ISO/IEC 42010:2007, Standards Department, IEEE, Piscataway, New Jersey, September 2000. ISBN-10: 0738125180

23. The Open Group. *TOGAF Version 9*. Van Haren Publishing, Zaltbommel, The Netherlands, 2009. ISBN-13: 9789087532307
24. J. Van't Wout, M. Waage, H. Hartman, M Stahlecker, and A. Hofman. *The Integrated Architecture Framework Explained*. Springer, Berlin, Germany, 2010. ISBN-13: 9783642115172
25. R. Wagter. *Sturen op samenhang op basis van GEA – Permanent en event driven*. Van Haren Publishing, Zaltbommel, The Netherlands, 2009. In Dutch. ISBN-13: 9789087534066
26. R. Wagter, G. Nijkamp, and H.A. Proper. Overview 1th Phase - General Enterprise Architecturing. White Paper GEA-1, Ordina, Utrecht, The Netherlands, 2007. In Dutch.
27. R. Wagter, H.A. Proper, and D. Witte. Enterprise Coherence Assessment. In A.F. Harmsen, K. Grahlmann, and H.A. Proper, editors, *Proceedings of the 2rd Working Conference on Practice-driven Research on Enterprise Transformation, PRET 2011, Luxembourg-Kirchberg, Luxembourg*, volume 89 of *Lecture Notes in Business Information Processing*, pages 28–52. Springer, Berlin, Germany, September 2011. ISBN-13: 9783642233876
28. R. Wagter, H.A. Proper, and D. Witte. A Practice-Based Framework for Enterprise Coherence. In H.A. Proper, A.F. Harmsen, K. Gaaloul, and S. Wrycza, editors, *Proceedings of the 4th workshop on Practice-driven Research on Enterprise Transformation, PRET 2012, Gdansk, Poland*, volume 120 of *Lecture Notes in Business Information Processing*. Springer, Berlin, Germany, June 2012. To appear.
29. R. Wagter, H.A. Proper, and D. Witte. Enterprise Coherence in the Dutch Ministry of Social Affairs and Employment. In C. Huemer, G. Viscusi, I Rychkova, and B. Andersson, editors, *Proceedings of the 7th International Workshop on Business/IT-Alignment and Interoperability (BUSITAL2012)*, Lecture Notes in Business Information Processing. Springer, Berlin, Germany, June 2012.
30. R. Wagter, R. Stovers, G. Nijkamp, and H.A. Proper. GEA-processes and products, a closer examination. White Paper GEA-6, Ordina, Utrecht, The Netherlands, 2007. In Dutch.
31. R. Wagter, M. Van den Berg, J. Luijpers, and M. Van Steenbergen. *Dynamic Enterprise Architecture: How to Make It Work*. Wiley, New York, New York, 2005. ISBN-10: 0471682721
32. J.A. Zachman. A framework for information systems architecture. *IBM Systems Journal*, 26(3), 1987.