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# TOWARDS AGILE PROJECTMANAGEMENT AND SOCIAL INNOVATION IN THE CONSTRUCTION INDUSTRY

**PAUL EVERTS**
PRO6 managers
p.everts@pro6managers.nl

**FRENS PRIES**
Hogeschool Utrecht
frens.pries@hu.nl

**STEVEN NIJHUIS**
Hogeschool Utrecht
steven.nijhuis@hu.nl

## Abstract

*Is project management developing towards a more human- or culture-oriented discipline? Two recent studies of the Dutch construction industry dealt with this issue, and the results of these studies have led to the conclusion that project management has developed in the opposite direction over the past few years, towards a 'harder', more instrumental approach with an increasing degree of specialisation. This approach works well with relatively simple and repetitive construction assignments, but project managers have noticed that their environment is rapidly increasing in complexity, and that this development limits their effectiveness. Some of these issues include the project's immediate surroundings (for projects in the city centre), legislation, regulations, procedures, the number of parties involved and judicial matters.*

*The highly instrumental management style described above is not entirely suitable for these increasingly complex construction projects. We have observed that these new construction assignments require new management paradigms, but that the existing paradigms are tenacious in their hold on managers' thinking. The dominant form of management today is still technical, Taylorian and instrumental, and the dominant management culture is still task- and results-oriented.*

*And yet there are some new developments in the field; lean or agile project management is clearly gaining momentum (or so the trade journals would have it seem). Within this 'movement', the human aspect takes precedence over the structure. The average project manager may be satisfied with his competencies in general, but he gives himself a low score on the 'human' or 'social' side of project management. That is also the facet he would most like to improve about himself; especially with regard to skills such as negotiation, conflict management and leadership.*

*There is a general trend towards social skills and away from purely technical expertise. This implies that project managers do not necessarily have to be engineers. The project manager of the future will definitely have to have people skills, but according to the project managers themselves, they still have a long way to go.*

**Keywords:** Social innovation, agile project management, lean manufacturing, project management competencies, project management careers, paradigm shift

## INTRODUCTION: STRUCTURAL LIMITS?

*The quest for success!*

The 'holy grail' for much of the research on project management is the search for success factors. What determines the success or failure of a project? An American study by Sloan, based on hundreds of case studies (not limited to the construction industry), shows that 70 to 90% of all projects are considered failures. Some reasons for this include: schedules based on political factors instead of hard facts, lack of support from the project sponsor, stakeholders and senior managers who circumvent formal decision-making processes, risks that are downplayed or ignored and team members who do not show up, do not keep to schedules or are insufficiently competent.

Another study asked project managers about failure factors (Arras People 2010). The results of this study supported the conclusions above and added others: scope creep (the project changes and the scope shifts in a different direction), incomplete requirements and poorly formulated or managed expectations. Similar studies have been conducted in the Prince2 environment (for example: Onna 2007) and PMI (2009). These studies also listed issues such as: confusion as to the client's role, lack of a proper project plan, vague definition of the expected result (both as to what it will be as well as what it should not be), overly optimistic schedules and lack of consideration for delays and changing requirements and principles during the project.

Remarkably, many of the failure factors fall in the category 'structure' or 'instrumental' (control is more important than involvement, a great deal of confidence in procedures and checklists, making plans and then rigidly executing them). The answer to failure can be found in the project management methods used, as they all resemble one another. The two most common in the Netherlands are:

- Prince2 (Projects IN Controlled Environment by the Office of Government Commerce)
- PMBOK (the PMI's Project Management Body Of Knowledge (2009))

*Problem statements and objectives*

This study deals primarily with the 'hard' side of project management; *"if your only tool is a hammer, all your problems look like nails"* (Maslov, 2011). Project managers usually approach problems by applying more structure to the project. This is only to be expected in a sector dominated by engineers: 95% of the managers in the construction industry have a technical background (Pries, 2005). However, it remains to be seen whether the use of even more structure and instruments is effective. Where one project suffers under the burden of too much structure when creative interaction is needed, another project may benefit from a rigid structure. Van Aken (1996) notes that in general:

- Use of instruments has a negative correlation with success;
- Working style correlates strongly with success;
- Few instruments are necessary to achieve success with goal-oriented work processes;
- In many projects, too much structure stands in the way of success.

This paper was drafted with the above discussion in mind. In it, we will discuss questions such as:

- Is project management a discipline that is primarily characterised by a hard, instrumental approach?
- Are there indications that project management is developing towards a more human- or culture-oriented approach?

This study is based on literature research and presents the following two studies;

- The first study (Pries, 2009) describes, examines and when possible quantifies various aspects of culture in the Dutch construction chain. This study is based on literature on the subject, an Internet survey of 241 individuals in the construction industry and 14 interviews.
- The second study (Everts, 2008) analyses the existing and desired competencies among project managers. The conclusions of this study are based on an Internet survey of 150 project managers and six interviews.

## DEVELOPMENT TOWARDS AGILE PROJECT MANAGEMENT?

*From 'instrumental-Taylorian' towards 'agile' project management*

Projectmanagement and organizational management are sometimes seen as the same fields of expertise, but studies show a clear difference between needed competences (Turner, Muller & Dulewicz, 2008). It has been argued that project management is going through the same learning cycle as management all be it with a time lag (Krahn, 2005). Even though both organizational management and project management now claim that they can be 'agile', this paper focuses purely on the latter. Meredith (2006) notes that traditional, hierarchical management is increasingly being replaced by 'consensual management'. One could see this as a form of 'social innovation', in that it deals with the emancipation of workers at all levels. Without treading into the sensitive area of definitions, we can describe this as an increased involvement of employees and clients in formulating policy and of the organisation in implementing that policy.

The world of project management also pays increasing attention to the human side of management (Pries, 2011). In the literature on project management, the concept of 'agile' management is clearly very popular. This agile management approach is especially popular in the field of ICT project management, but we have not yet observed it in the Dutch construction industry.

Agile originated in the world of ICT and software development. It displays many of the characteristics of 'lean thinking'. "Lean Software Development; an agile toolkit (Poppendieck, 2003)" is an example of the concept that originated in Japanese Lean Manufacturing. The Manifesto of the Agile Alliance (http:/www.agilealliance.org/) states: *"We are uncovering better ways of developing software by doing it and helping others do it. Through this work we have come to value: individuals and interactions over processes and tools; working software over comprehensive documentation; customer collaboration over contract negotiation; responding to change over following a plan. That is, while there is value in the items on the right, we value the items on the left more".*

Agile stands for individual interaction rather than procedures and tools; results above paper predictability and reacting to change instead of rigidly following the original plan. In this sense, agile seems to better suit the current zeitgeist than traditional project management due to the dramatic increase in environmental turbulence and complexity in the construction industry (Pries, 2011). In a simple, stable world, traditional project management would suit

just fine; plans are drawn up based on relatively predictable variables and the manager can simply follow the plan. However, in a complex and rapidly changing world, this method is no longer sufficient. Manoeuvrability and flexibility are vital, as managers must be able to adapt to inevitable changes. There is no room for bureaucratic organisations and rigid procedures. Aspects that do fit into this paradigm include (Pitagorski, 2008):

- Self-managing or self-organising teams
- Plenty of interaction with the client, "even when there isn't a problem to be solved!" (Blais).
- Balance between 'top-down' and 'bottom-up'
- Motivated individuals; according to the Agile Alliance: "Build projects around motivated individuals. Give them the environment and support they need, and trust them to get the job done". But Pitagorsky does raise some doubts about this method. It is useless to ignore the fact that there is a great deal of variation in the competencies of different individuals. Blind confidence is counter-productive; some kind of balance must be found.
- A leader should become more of a coach and facilitator, clearing obstacles from the team's path.

## INTERLUDE: A CONTROVERSY BETWEEN AGILE AND TRADITIONAL PROJECT MANAGEMENT?

The academic literature on the subject suggests that there is a conflict between the two approaches to management, but in practice the difference is more subtle. As Pitagorsky (2008) explains: *"The challenge is to stay lean and agile and to satisfy the control needs (…) by blending the wisdom of the traditional and Agile PM approaches. The right blend of formality and flexibility is essential for ongoing success"*. The difference may seem black-and-white in theory, but in reality there are several shades of grey. This is an opinion that the authors find easy to live with. The challenge is to select the right project management model for each specific project. When the project is absolutely unique and displays a high level of complexity with many parties and interests involved (and therefore many potential conflicts), then the manager should not implement a hierarchical and bureaucratic project management model. However, if the accent lies more on implementing a relatively simple plan that enjoys broad consensus among all parties, then such a plan would be ideal. Of course, every project progresses through different phases. The earliest phases of the project demands a more agile approach (exploratory, conceptual, value-adding, interaction), while the later phases will often require a more traditional approach to project management (managing, technology, focus on costs).

*Is structure unnecessary then?*

We often hear people in the construction field saying 'that culture nonsense' may all be well and good, but that there are still too many fundamental mistakes being made. Contracts and procedures are drawn up wrong and technical design mistakes frustrate the builders. There is of course truth in all of this. Managing the structure is vital in a technical world. Structural thinking is far from nonsense; attention to the structure is absolutely necessary. However, it is much easier to work within a structure if attention is also paid to the culture of cooperation. After all, a person with two legs doesn't hop around on one all his life. It is in this field of culture, or the 'human side' of project management that we are falling behind, and it is on this point that we must innovate as a sector (Pries, 2009). We must invest more in the cultural dimension.

## INTERLUDE: THOUGHTS ON ORGANISATION AND COMPLEXITY

*How fragmentation has become our worst enemy!*
Building used to be much easier in the Netherlands. There was a client, an architect and a contractor. The architect was the boss and the contractor had all-round craftsmen in service. High-quality buildings were assembled by high-quality labour using low-quality materials. After World War II, the focus was on quantity production. These uniform construction tasks offered plenty of opportunities for series production. At that time, especially in the 1960s in the Netherlands, our sector went through large-scale innovations (Pries, 2005; Doree, 2005). Large-scale use of concrete, large elements, modular high-rise buildings; all were phenomenal innovations. Those were also the days of the time-and-motion study. Using a stopwatch, managers could measure productivity and construction increasingly became a science.
The number of specialists also began to increase. The leading role once played by the architect has exploded into 10 specialised consultants, and the average building site now has 30 to 40 subcontractors getting in each other's way.

*What about the theory?*
This development corresponds with what we find in the literature on the subject. When we examine operations research (as in Daft, 2006; Pries,2009; SBR, 2005; SBR, 2007), then we see a relationship between the serial nature of the production (or its complexity) and the size of the series. Small, difficult series result in piecework, while large, simple assignments are ideal for series production or even mass production (although this does not apply to the construction industry). Piecework requires high-quality labour and craftsmanship, little specialisation, few formal procedures and decentralised decision-making, a well-trained craftsman is only hampered by procedures and checklists.

*The times have truly changed!*
In today's Dutch construction industry, we are still confronted with the assumption that we can continue with series production. We are faced with countless sub-contractors, a large number of specialists at the construction site (each chosen by lowest bid), coordination problems, but also a fundamentally changed building assignment. Just five years ago, 70% of all homes were built on the edges of the city, where it was relatively easy to build. But today 70% of our assignments are in the complex existing built environment (Pries, 2010). This existing environment comes with its own residents, interest groups and logistical challenges. On top of that, 50 cents of each Euro spent on construction goes to renovation, management and maintenance, and those types of production are much less predictable than new construction. There are no projects involving thousands of homes any more, today's homes must all be unique and consumer-oriented. Moreover, we are faced with any number of sustainability regulations that will fundamentally change our building process. All together, these changes present us with all of the ingredients for chaos. We are faced with a difficult, small-scale assignment that we still want to approach with a simple, large-scale solution.

## CULTURE WORKS!

*Introduction*

We have noticed that people in the construction industry find the culture of cooperation extremely interesting, and they suspect that it may be very important, but that they lack the knowledge and skills necessary in order to implement it (Pries, 2009). We have therefore defined, studied and when possible quantified the various aspects of culture in the building chain.

*The importance of culture*

Much has changed in the construction sector in recent years. The complexity of the rules and interests pertaining to building projects is here to stay; construction will never go back to the simplicity of yesteryear and we will have to get used to the fact. The natural reaction of the construction industry has been to adopt more bureaucracy and systems like ISO 9001, VCA and a focus on documenting every exception. Our real challenge is to learn how to work together better, but that is not an automatic process (Pries, 2008).

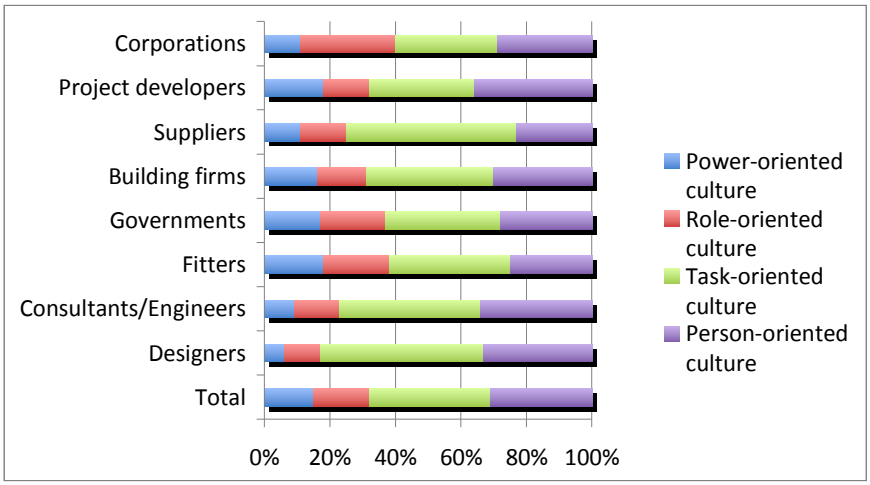
- Cooperation between people with different organisational cultures is by no means a matter of course;
- People often lack any conception of 'other' cultures, and this impedes understanding. Note that this brings an extra problem in the field of project management, because some terms may even have different meanings: goal/result, project charter/project plan/plan of attack, etc. This definitely does not help us understand one another;
- There is often a lack of tolerance for other cultures;
- Dominant parties expect other parties to adapt to their culture;
- The consequences of these issues may include: mistrust, tension and conflict.

*Results of the study: task-oriented culture dominates*

In a power-oriented culture (Harrison, 1972), people want to make quick decisions. In a role-oriented culture, people want to make careful decisions. In a task-oriented culture, the higher goal is the priority and in a person-oriented culture, the person's own goal is the priority. The task-oriented culture dominates the building chain (37%), but other cultures exist as well. Cooperation among the parties should produce few problems, as they generally share the dominant culture. And yet we observe that the minor differences can lead to misunderstandings in practice;

- Project developers, consultants and designers are more likely to have a person-oriented culture;
- Suppliers, designers, consultants and builders are more likely to have a task-oriented culture;
- Corporations, fitters and governments are more likely to have a role-oriented culture.

*Distribution of organisation culture types in the building chain*




The good news is that the differences are relatively minor. With just a little effort, we should be able to understand the other parties.

*Cooperation in the construction industry graded C-*

Symbols, heroes and rituals are expressions of a particular culture (Hofstede, 1993). These aspects do not determine the culture and can change relatively easily. This study provides an overview of these cultural expressions by the various parties. The construction industry is generally an informal sector. People in the industry generally address one another by their first names. Informal meetings are relatively common in the industry. With the exception of project developers, few people wear suits.

Values are the core of any culture. The construction industry is an ambitious sector; almost 90% of the respondents state that they consider ambition to be healthy. Other results of the study are often entirely predictable:

- Meetings often last too long;
- We communicate a great deal via E-mail and not enough face-to-face;
- Internal political hassles are common;
- Managers are promoted from within the sector itself;
- The result is not the only thing that matters (with the exception of project developers (75%), suppliers (58%) and fitters (57%));
- We do not always understand other parties in the building chain. We give ourselves a satisfactory score, but designers and the government are known for understanding other parties poorly. ***We understand one another to a certain extent, but we do not fully understand one another's working methods;***
- ***We feel that we understand other parties better than they understand us.***

## THE ENGINEER AS A TYPICAL PROJECT MANAGER?

*Introduction: the engineer as a typical project manager?*

In the previous section, we saw that construction management is dominated by a technical, Taylorian and especially instrumental approach. The culture is primarily results- and numbers-oriented and cooperation is hindered by exaggerated misconceptions of one another. The industry is beginning to realise this fact (Pries, 2009), and people are recognising that the old way of working is no longer sufficient; we are becoming aware of our limitations.

If this is true, then it should also reflect in the opinions of the project managers themselves. Do our project managers consider themselves well-equipped for their job? Using a survey of 130 project managers, we worked to find the answers to these questions. This was an emphatically introspective study of the self-image of a representative group of project managers, clients, builders and consultants.
In the following section we will argue that project managers will have to adapt to agile project management as the focus shifts from technical knowledge to culture and social skills. As stated before, agile can be applied to organizational management as well, but in this paper only agile project management is discussed.

*From technical competencies to social competencies?*
Competencies consist of characteristics, knowledge and skills (van Doorn, 2008). Characteristics are not easy for people to acquire or discard; either you have it or you don't. Remarkably, this category gets the highest score. Apparently, project management is not something that anyone can learn (see table below for details).

Project managers consider themselves able to deal with stress, honest, technically proficient (83% of the respondents has a technical background) and persistent. The average project manager is satisfied with his competencies; none of the competencies were rated unsatisfactory. Especially older project managers indicate that they have little that they still wish to improve about themselves.

Results for competencies (purple: characteristic. green: skill. blue: knowledge).

| **Which competencies do you consider important? Scale:** | | **Grade average project manager: Scale:** | | **Which competencies would you like to improve? Scale:** | |
|---|---|---|---|---|---|
| Proactive | 4.7 | Deal with stress | 7.5 | Negotiating | 3.4 |
| Decisive | 4.5 | Honest | 7.4 | Managing conflicts | 3.3 |
| Communicative | 4.4 | Persistent | 7.4 | Risk management | 3.3 |
| Able to listen | 4.4 | Decisive | 7.2 | Inspiring | 3.1 |
| Honest | 4.4 | Intelligent | 7.1 | Leader | 3.0 |
| Team builder | 4.3 | Essentials of working in | 6.9 | Managing contracts | 3.0 |
| Persistent | 4.3 | Technical expertise | 6.9 | Managing surroundings | 3.0 |
| Essentials of working in projects | 4.2 | Proactive | 6.8 | Team builder | 2.9 |
| Leader | 4.2 | Disciplined | 6.8 | Communicative | 2.8 |
| Risk Management | 4.2 | Leader | 6.7 | Information & communication | 2.8 |
| Time management / Planning | 4.2 | Time management / Planning | 6.7 | Pro active | 2.7 |
| Deal with stress | 4.2 | Negotiation | 6.7 | Cost-benefit awareness | 2.7 |
| Information & Communication | 4.2 | Communicative | 6.6 | Disciplined | 2.6 |
| Inspiring | 4.1 | Cost-benefit awareness | 6.6 | Time management / Planning | 2.6 |
| Cost-benefit awareness | 4.1 | Contents plan of approach | 6.6 | Regulations & permits | 2.6 |
| Empathic | 4.1 | Inspecting | 6.6 | Able to listen | 2.6 |
| Conflict management | 4.0 | Procedures within your firm | 6.6 | Decisive | 2.5 |
| Organisation | 4.0 | Meeting | 6.5 | Organisation | 2.5 |
| Management surroundings | 4.0 | Team builder | 6.4 | Quality management & control | 2.5 |

| | | | | | |
|---|---|---|---|---|---|
| Negotiation | 3.9 | Organisation | 6.4 | Contents plan of approach | 2.4 |
| Intelligent | 3.9 | Information & communication | 6.3 | Inspecting | 2.4 |
| Managing contracts | 3.8 | Reporting | 6.3 | Empathic | 2.4 |
| Disciplined | 3.8 | Empathic | 6.2 | Able to deal with stress | 2.3 |
| Contents plan of approach | 3.7 | Managing contracts | 6.2 | Essentials of working in projects | 2.3 |
| Quality management and control | 3.6 | Managing conflicts | 6.2 | Meeting | 2.3 |
| Reporting | 3.5 | Inspiring | 6.1 | Reporting | 2.3 |
| Meeting | 3.5 | Managing conflicts | 6.1 | Persistent | 2.1 |
| Inspecting | 3.4 | Managing surroundings | 6.0 | Intelligent | 2.1 |
| Regulations and permits | 3.3 | Regulations and permits | 6.0 | Technical expertise | 2.1 |
| Procedures within your firm | 3.3 | Able to listen | 5.9 | Procedures within your firm | 2.1 |
| Technical expertise | 3.1 | Risk management | 5.9 | Honest | 1.6 |

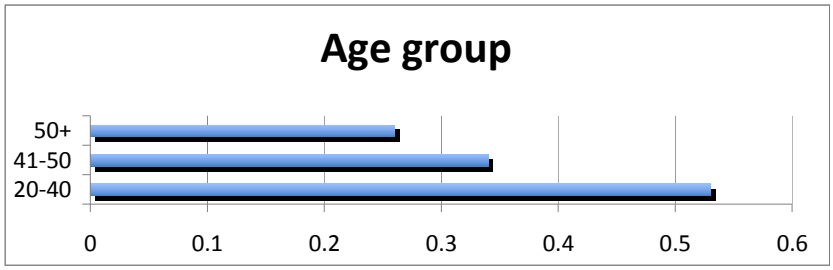
*Social competencies: the male engineer as typical project manager?*

Project managers give themselves a low grade for 'ability to listen', conflict resolution, empathy and ability to inspire. They also consider themselves poor team builders and mediocre leaders. This ‘human‘ or ‘social' side of project management is also the side that they would most like to improve about themselves, especially with regard to skills such as negotiation, conflict management and leadership. Older project managers in particular place more value on a proper technical background, and men consider it more important than women.

*Which developments do project managers observe in the sector?*
Project managers see that their environment is rapidly becoming more complex and that this development impedes their performance. Some of these issues include the project's immediate surroundings (for projects in the city centre), legislation, regulations, procedures, the number of parties involved and especially judicial matters.
More than 60% of the respondents have practical experience with an integrated contract, and almost 40% have experience with an even more intense form of cooperation. According to this study, older managers are more likely to implement innovative types of contracts than younger managers. This may seem logical, but younger managers generally consider themselves to have better social skills than older managers, and it is that competency that is vital for construction organisational models that require cooperation.

*What differences in vision exist among the various project managers?*
Do male project managers give different answers than female managers, and are there differences between younger and older project managers? Remarkably, there is a significant degree of consensus among the different project managers. Only a few points showed any significant differences. These will be dealt with per category below.

Young-Old (experienced-inexperienced)
Young managers prefer the human side of project management. They value communication more highly and think that good people and teams contribute the most to successful projects. They also prefer working for public organisations. As the graph below shows (1=100%), more than half of all young project managers work for public organisations, while only around 25% of the older managers work in public organisations.




Do women have better social skills?
Here we observed a number of remarkable differences. For example, men would like to improve their environmental management skills and their discipline, while women would like to be able to deal with stress and improve their leadership skills. The results indicate that women place a higher importance on, and give themselves higher scores for, 'social' competencies. They also indicate that their social competencies help them realise successful projects. However, when asked what they would like to improve, they state that they would like to improve their more technical competencies. Men answered this question in the exact opposite.

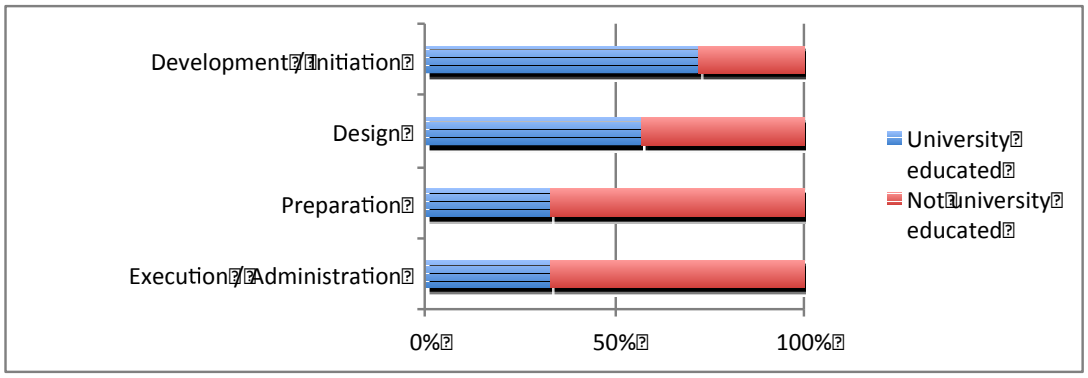
Women are more likely to work for clients; in fact, there was not a single woman in this study who worked for a contractor. The study also indicated that there were more female respondents in the younger categories. This may indicate that the percentage of female project managers in the construction industry is increasing, but it may also indicate that the more experienced women are leaving the industry. The women working as project managers today state that they are planning on remaining employed in the construction industry.

Clients vs. contractors.
Contractors are more likely to value expert knowledge and time management more highly than communication. Project managers working for clients give themselves a higher grade for managing their surroundings and communication. Contractors also think that ICT solutions will become more important to the construction industry in the future. As a result of the increase in innovative contract types, we might expect contractors to become increasingly interested in the competencies related to the design phase and cooperation. Some examples of these competencies include: interest in the end user, negotiation, communication and listening ability. However, the results point to the contrary.

Differences between the building process phases?
Project managers in the preparation phase place less emphasis on pro-activity and more on risk management. They also give themselves higher scores for managing their surroundings, organisation and quality control.

The question as to which factors contributed most to success did not produce significant differences; a remarkable unanimity of opinions across the board. The only extraordinary result was that project managers place a higher value on detailed procedures during the execution phase. In general, the managers do not differ significantly in their thoughts on project management competencies in the different phases of the project. Whether they work in the development or in the execution, they all had similar ideas of the function of project management. This may be one of the reasons why so many of the respondents can work in several phases of the project, or even all of the phases, at the same time. When we differentiate between the level of education in the different phases, it is clear that university-

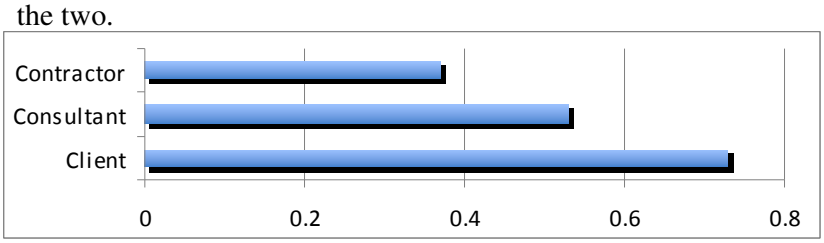
educated managers are more common at the start of the realisation process, while those educated at universities of applied sciences are more common at the end.




From the comparison between the project phases and the different age categories, we noticed the remarkable difference that older managers (50+) make up only a small percentage in the early phases, while the age differences are less pronounced in the preparation and execution phases. This corresponds to the results in that we have shown that older project managers place a higher value on technical expertise and less on the social skills required in the earlier phases.

How do project managers develop their competencies?
A number of questions in this study dealt with how the project managers developed their competencies. The section below will deal briefly with the results of these questions.

- Only 34% of the respondents works for an organisation that spends more than one day per month on personnel development. It would be interesting to compare these data with data from other sectors, such as the service sector. Only 18% of the respondents have a mentor.
- Project managers throughout the construction industry state that practical experience is by far the most important factor in their personal development. Remarkably, training courses receive higher scores than their own academic education.
- More than 30% of the project managers expect to move up to general management within their own organisations. Aside from the question of whether this is a realistic goal, we can ask ourselves if it is a desirable one. Should good project managers be promoted away from producing successful projects? We should make careers in the project management field more attractive.
- Managers are more likely to visit their superiors' projects than those of their juniors.
- The chart below shows that project managers working for a client are more likely to have a personal development plan (PDP) than their colleagues. This may be an indication that clients place a higher priority on developing their personnel. This difference was also observed between public and private employers. Aside from these categories, the study showed that approximately half of the respondents do not have a PDP. We should note, however, that a PDP is no guarantee for actual personal development, as there is no literature that shows any actual correspondence between the two.



- Despite the problems involved, the complexity of the work and the responsibility involved, project managers as a whole enjoy their work. They give their job an average score of 4.4 out of 5. 80% of the respondents state that they hope to continue working in the sector, 20% are undecided and none have any concrete plans to leave the construction industry in the future.

*Some recommendations*

The study was primarily descriptive, providing a sketch of the most important job in the construction industry - the project manager. And yet we can still formulate the following recommendations:

- A good project manager does not always have to be a male engineer! Women function well in innovative contract forms and in complex project environments. Organisations that do not recognise this fact are not doing themselves a favour.
- Contractors in the construction sector should pay more attention to developing their personnel. This may include more internal training courses, mentorships and personal development plans. Only 34% of the respondents work for an organisation that spends more than one day per month on personnel development. Only 18% of the respondents have a mentor.
- Educational institutions should examine whether they provide people with the proper competencies. Technical training has traditionally been very important in the sector, but the reality in the field shows that it may be desirable to reconsider the skills necessary for success. Notably: industry tends to critique the PBL forms, which especially train people skills.

## CONCLUSION

In this paper, we asked whether project management is a discipline that is primarily characterised by a hard, instrumental approach and whether there are developments toward a more human- or culture-oriented approach.

We realise that this paper does not provide any definitive answers to this question, as the scope is too broad and the subject is too new. We then examined the literature on the subject and presented two studies. These studies, how valid they may be, are applicable only to the Dutch context. We are curious as to the experiences in other countries correlate with our findings. Based on the information above, we can present the preliminary conclusions below:

- In the years of reconstruction following World War II the project management field developed towards a hierarchical, instrumental management model. Procedures, systems and checklists were combined with a Taylorian management style; PRINCE2 and PMBOK are still popular project management models. One could say that this was a logical development considering the serial, quantitative assignments then common.
- Building has rapidly become more complex and project managers see that their environment has rapidly become more complex as well, which has made their job more difficult.
- An instrumental management model is ideal for simple, serial production methods, but this method is less suitable for more complex assignments. Project managers must be able to adapt to changing circumstances.

- One can conclude that these new construction assignments require new management paradigms, but that the existing paradigms are tenacious in their hold on managers' thinking (Doree, 2005). The dominant form of management is still Taylorian, hierarchical and instrumental. The dominant culture is still task- and results-oriented.
- The study shows that people from different cultures working within the same project still do not automatically cooperate well. There is often a lack of tolerance for other cultures. In fact, managers are often completely oblivious to the existence of other cultures. Each party expects the other to adjust to their culture, resulting in less than optimal cooperation.
- And yet there are some developments in the field. 'Lean' or 'agile' project management is clearly on the rise, at least in the literature on the subject. Within this 'movement', the human aspect takes precedence over the structure. Interaction is more important than process management and tools. Agile management is best coupled to the complexity of the project.
- The average project manager is satisfied with his competencies. Project managers on average give themselves a low score for the 'human' or 'social' aspects of project management. That is also the facet they would most like to improve about themselves; especially with regard to competencies such as negotiation, conflict management and leadership. This indicates a general trend towards more social competencies and away from purely technical expertise. Older project managers in particular place more value on a proper technical background, and men consider it more important than women. The issue is not who has the right idea. The technical side is and will remain important, but it is no longer the only solution. This implies that project managers do not necessarily have to be engineers. The project manager of the future will also have to have social skills. According to the project managers themselves, they still have a long way to go to achieve this goal.

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