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The development of constructs of program context and program success: A qualitative study

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Abstract

Growth in the use of programs to achieve organizational strategy has led to a requirement to understand the leadership competences of effective program managers. This paper presents the results of the first stage of a larger study on the influence of leadership on program results. A qualitative, inductive interview-based approach was used with 15 program managers from a range of industries in China, Sweden, The Netherlands and the UK. The purpose of this qualitative study is: a) to develop the constructs for *program context* and *program success* in the research model in order to design a questionnaire for the subsequent quantitative study; b) to collect data from program managers on the magnitude and mix of *leadership competences* needed for successful program management. In addition to the development of measurement dimensions for *program context* and *program success*, the results also show that program managers' leadership competences are a key success factor in program management and program managers' leadership styles are contingent on program context.

Keywords: Program success; Program context; Leadership competence

1. Introduction

Program, as an effective project governance mechanism, provides a bridge between projects and organizational strategy. It is now widely used by a large number of organizations. Maylor et al. (2006) termed this emergent tendency as from "projectification" to "programmification". With programs becoming popular, the challenge of managing these complex endeavors is put forward for program managers. Are programs just a collection of projects? Is program management just an advanced form of project management? Is a program manager just an expert project manager? Partington et al. (2005) and Pellegrinelli (2002, 2008) answered these questions by saying *NO* because they believed that program managers require "a subtle blend of interpersonal skills and personal credibility, a deep understanding of the political dynamics of the formal and informal networks that form the organizational context, and a great knowledge of the broader strategic context" (Partington et al., 2005, p. 87), whereas project managers tend to focus on delivering tactical deliverables in an efficient way (Thiry, 2004).

To investigate the competence requirements for program management, Partington et al. (2005) and Pellegrinelli (2008) conducted multi-organization studies on the attributes of program management work and developed a program management competence framework for the role of program managers. However, competence is a broad concept which consists of knowledge, skills, personal traits and demonstrable performance (Boyatzis, 1982; Crawford, 2005). Leadership competence, as a subset of competence, attracts broad attention of researchers, such as Dulewicz and Higgs (2003, 2005) and Turner and Müller (2006) etc. Turner and Müller (2006) investigated leadership competences of project managers. They found that the project managers' leadership styles, as a reflection of their leadership competences, have a positive relationship with project success in different types of projects.

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In a larger study the authors have addressed the following questions: what are the required leadership competences for program managers; how do program managers' leadership competences influence program success; whether program contexts impact the relationship between leadership competences and program success. This qualitative study presents the first stage of the larger study. The purpose of this qualitative study is: a) to develop the constructs for *program context* and *program success* in the research model in order to design a questionnaire for the subsequent quantitative study; b) to collect data from program managers on the magnitude and mix of *leadership competences* needed for successful program management. To achieve these purposes, the research questions asked in this qualitative study are:

- What are the constructs for *program context*?
- What are the constructs for *program success*?
- What *leadership competences* are needed for successful program management?

The units of analysis in this qualitative study are program context, program success and the program manager.

The next section of this paper recalls the previous research on program managers' leadership competences, program context and program success. Based on the literature review, the knowledge gaps are identified. Then the research methodology in the qualitative study is described. This is followed by the description of the qualitative study results and discussions of the implications. Finally, the next step in the overall research project is discussed.

2. Research into program managers' leadership competences, program context and program success

This section reviews the literature on program managers' leadership competences, program context and program success.

2.1. Research into program managers' leadership competences

The importance of adopting program management to achieve planned benefits and strategic goals has come to a consensus in both academic and practitioner circles (Partington, 2000; Murray-Webster and Thiry, 2000; Lycett et al., 2004; PMI®, 2006; OGC, 2007). The argument focuses on whether the position of program managers can be fulfilled by experienced project managers. The previous research results showed that it is not appropriate (Partington et al., 2005; Pellegrinelli, 2002, 2008; Blomquist and Müller, 2006; Thiry, 2002, 2004). For example, the results of Partington et al.'s (2005) multi-organization studies on program management competences show that it is not reliable to promote proven project managers into a program manager role, because individuals have the tendency to re-create the approach and environment which has served them well on their more defined initiatives. Project management principles may hinder the higher-level conceptions of program management work. Project managers and program managers have different competence profiles. Project managers usually focus on the short-term tactical deliverables and are concerned with project performance indicators, like time, cost, functionality etc. Program managers focus on long-term business results and are concerned with benefits realization, strategy achievement and value creation. These differences lead to different competence requirements.

Partington et al. (2005) and Pellegrinelli (2008) developed a comprehensive program management competence framework which consists of 17 attributes of program management work being categorized into three groups of relationships and each attribute is conceived at four levels in a hierarchy of competence. This framework builds on the results of embedded multiple case studies and in-depth interviews using ethnography research method. This competence framework is greatly acknowledged in program management area. For example, it is embodied in a well-known program management standard, namely *Managing Successful Programmes* (Office of Government Commerce (OGC), 2007).

Competence is a broad concept. It constitutes of people's knowledge, skills, core personality characteristics and demonstrable performance (Boyatzis, 1982; Crawford, 2005). In Partington et al.'s (2005) program management framework, they classified program management work in terms of 17 attributes and identified a hierarchy of four level competences for accomplishing these program management attributes; however, they did not identify particular competence groups, such as leadership competence.

Turner and Müller (2005) summarized six schools of leadership chronologically: trait school, behavior school, contingency school, visionary and charismatic school, emotional intelligence school and competence school. Trait school focuses on leaders' traits people are born with, such as their physical appearance, capabilities and personalities. Behavior school emphasizes the styles adopted by leaders for their particular leadership task and the leadership styles and behaviors can be learned. Contingency school is concerned with the appropriateness of different leadership styles in different leadership situations. Visionary and charismatic school focuses on organizational change. Emotional intelligence school focuses on self management and interaction management. Competence school encompasses all the earlier schools. Competence means a specific combination of knowledge, skills and personal characteristics. The representatives of competence school are Dulewicz and Higgs (2003, 2005).

Dulewicz and Higgs (2003, 2005) did a series of studies on individual's leadership competences. They designed the Leadership Dimensions Questionnaire (LDQ) to capture the leadership competence profiles of effective leaders. In the LDQ, leadership competence is constructed by fifteen dimensions grouped into Intellectual Competences (IQ, including three dimensions), Managerial Competences (MQ, including five dimensions) and Emotional Competences (EQ, including seven dimensions). These fifteen leadership dimensions can be retrieved in Table 5. Furthermore, the survey using the LDQ with a sample size of more than 1000 respondents helped them to identify three leadership styles for organizational change projects, which are engaging, involving and goal-oriented.

Besides that, they found that these three types of leadership styles are associated with different organizational contexts. Engaging leadership style fits for the transformational context with radical changes in the organization; involving leadership style is appropriate for the transactional organizational context with significant but not radical changes; and goal-oriented leadership style is suitable for relatively stable context delivering clearly understood results.

The LDQ was developed from research with general managers and senior officers. Although the LDQ was tested and has proved its validity in particular industries or public sectors, like in the Royal Navy in UK (Young and Dulewicz, 2006), it was not specially developed or used for project management related roles. And researchers assumed that the leadership competence profiles of general line managers are different from those of project managers (Keegan and den Hartog, 2004; Turner et al., 2009). Turner and Müller (2006) were among the first to use the LDQ to assess project managers' leadership competences. Their research proved validity of the LDQ in project management field.

Turner and Müller (2005) and Jugdev and Müller (2005) reviewed literature on project success and they found that project managers play an important role in achieving project success and are key success factors in project management. Then Turner and Müller (2006) and Müller and Turner (2007a, b, 2009) researched how project managers, through their leadership competences, lead their project team to achieve project success. Their research results showed that a project manager's leadership style is contingent on project context; if they fit with each other, it will greatly increase the chance of achieving project success.

In summary, program is not just a collection of projects. The competence requirement for program managers is different from that of project managers (Pellegrinelli, 2008). Research done on program management competences (e.g. Partington et al., 2005) increased the understanding of the role of management competences and attitudes, but did not specify the role of leadership competence. Research on leadership competences (e.g. Dulewicz and Higgs, 2003, 2005) did not originally address to project or program related roles. Prior research on project managers' leadership styles (e.g. Turner and Müller, 2006) explored project manager's leadership competences; however, their results might not be transferable to program managers. Therefore, a knowledge gap arises and it is shown in Fig. 1, namely, the "program manager's leadership competences". It becomes the bridge among the "program management competence", "leadership competence" and "project manager's leadership competences".

Knowledge gap 1. Program managers' leadership competences.

2.2. Research into program context

Program management literature stresses the importance of program context for the management of programs. Lycett et al. (2004) stated that effective program management approaches should be dynamic and flexible, adaptable to the changing context and relationship-based. Pellegrinelli et al. (2007) observed in their case study research that contextual factors in program management often draw much of the program managers' attention and efforts, causing them to compromise and re-shape their programs. Pellegrinelli (2002) asserted that program directors and managers should take the responsibility of shaping a context for program and projects. In the context they shape, they embed and align the program to the evolving needs of the organization and shelter projects from the external turbulent and uncertain environment.

Fig. 1. Knowledge gap.

Pellegrinelli et al. (2007, p. 41) defined program context as "a dynamic cultural, political and business environment in which the program operates". However, from this definition, it is not easy to identify the concrete constructs for program context. The existing literature cannot provide much information on program context constructs. Therefore, a knowledge gap on the constructs of program context arises here.

Knowledge gap 2. The constructs of program context.

2.3. Research into program success

Shao et al. (2009) reviewed literature on program success, and they found that the definitions for program success still remain at conceptual level, and there is little literature offering measurement dimensions for program success. For example, guidance and standards in program management field, such as 'The Standard for Program Management' by the Project Management Institute (PMI®, 2006) and 'Managing Successful Programs' (MSP) by the Office of Government Commerce (OGC, 2007) defined program success as benefits realization. Thiry (2002) suggested appraising program performance from value creation and learning loop perspectives. Pellegrinelli (1997), Lycett et al. (2004) and Reiss et al. (2006) linked program success with bringing about organizational change. Partington (2000) and Maylor et al. (2006) suggested that program success lies in the achievement of organizational strategies through programs. All these research provide insights on program success assessment, however, little indication on specific program success constructs is revealed. Thus a knowledge gap arises here about the constructs of program success.

Knowledge gap 3. The constructs of program success.

Shao et al. (2009) hypothesized a preliminary research model on the relationship between program manager's leadership competences and program success, and suggested that there is a moderation effect by program context (see Fig. 2). Their model provides a way to fill the *knowledge gap 1* about program management leadership competences. However, to execute their model, *knowledge gap 2 and 3* about the constructs of program context and program success are required to be fulfilled in the first place.

3. Research methodology

This section describes the research method adopted in this qualitative study. A critical realism perspective was taken using an inductive approach and semi-structured interviews.

3.1. Development of data collection instrument

An interview protocol is developed to collect empirical data (see Appendix 1). The questions in the interview protocol are derived from the literature, the existing theories and discussions with supervisors as suggested by Saunders et al. (2009). Five different sets of questions were addressed in the interview protocol. These are:

1. The nature of the companies and the nature of the programs the interviewees last managed
2. Program success criteria
3. Program success factors and program manager's competences, especially their leadership competences
4. Program context, mainly including its definition and impacts in program management practice
5. Other comments from program managers related to program success, program context and program manager's competences.

The first set of questions is developed to collect information on programs and their parent organizations in order to get the whole picture about programs, such as their types, scales, life-cycle stages, industrial areas etc. The second set of questions is asked to obtain program managers' assessments on program success. Are program success criteria the same with project success criteria in real life? If no, what is the difference? Through this set of questions, together with the results from the previous success literature research, the preliminary constructs for program success can be proposed. The third set of questions is to investigate whether program managers' leadership competences is one of the success factors in programs. If the answers are positive, they provide evidence to validate the research model of the larger study. The fourth set of questions is to explore the definition and characteristics of the concept of program context, and program contexts' impact on program management. The last set of questions is designed to give the interviewees the opportunity to add anything else they consider relevant to the research subject.

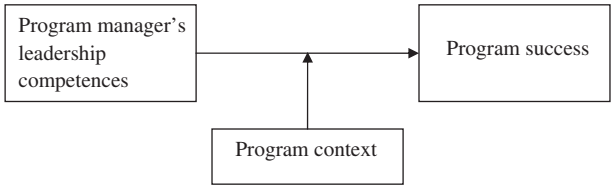

Fig. 2. Research model on program management leadership competences and program success.

3.2. Sampling

The sampling method used for the interviews is theoretical sampling, which means the interviewees should be the people who have the best knowledge of the research subject and the number of interviews is determined through theoretical saturation. This means when the answers from interviewees converge to the extent that no new concepts or categories can be derived in the analysis, then the sampling can be stopped (Corbin and Strauss, 1990; Bryman and Bell, 2007).

The data collection strategy aims for a broad variety in industries and geographies. The aims are twofold: a) to find commonalities but not differences in order to build constructs for the variables in the research model, namely *program context* and *program success*; and b) to achieve a higher level of generalizability of results.

3.3. Data collection

Fifteen semi-structured interviews were conducted until theoretical saturation was reached. Participants were from ten different organizations in seven industries, such as engineering, manufacturing, consulting, IT, retail, finance, government departments, and across the four countries of China, Sweden, The Netherlands and the UK. Their demographic information is summarized in Appendix 2.

In common with many researchers conducting multi-organization studies involving interviews with high-level managers, our ideal research plan had to be compromised with practical information or individual availability and some adjustments were made during the research execution (Partington et al., 2005; Tatikonda and Rosenthal, 2000). In three companies we had to accept interviewees from other roles than the targeted program manager roles. These were a mega-project manager, an assistant program manager and a PMO director. We accepted them as our interviewees because they were involved in the program management work to a large extent, and they were familiar with program management in their organizations.

In agreement with the interviewees the interviews were tape recorded. Notes were taken during the interviews and the records were written up afterwards. Both the notes and interview write-ups were compared for cross validation.

3.4. Data analysis method

One objective of the interviews is to develop constructs and measurement scales for the concepts of program context and

program success in the research model. At the beginning very little preconceptions about program context and program success were available. For program context, Pellegrinelli (2002) and Pellegrinelli et al. (2007) indicated that the so-called program context is a dynamic cultural, political and business environment in which the program operates. It is a general definition for the concept and cannot be used directly to measure the concept. It is the similar case with the concept of program success. The literature on success focuses mainly on project success, like Shenhar et al. (1997), Shenhar and Wideman (2000) and Turner and Müller (2006) etc. Given the distinctiveness between program and project, we assumed that there are differences in judging program success. So empirical data need to be collected from practitioners to develop the constructs for the two concepts, program context and program success.

Inductive data display and analysis techniques were used to analyze the interview data. This was done using the process of data reduction, data display, and conclusion drawing and verification (Miles and Huberman, 1994). To identify codes and develop categories, we followed the coding process through using the constant comparative method as described by Glaser and Strauss (1967). In the following, the coding process is illustrated in detail.

Firstly, the raw data was disaggregated into conceptual units and provided with labels, which are codes. For example, when the first interviewee was asked to define the key success factors for her program, she gave us the following statement:

> *…understand strategy, because one of the main things the program has to do is to define the candidate projects in the program, link the projects to the strategy. I think it is the number one, understand the strategy and choose the appropriate projects, and link things together, balance the strategy, find the combination between the strategy and operations.*

By analyzing the meaning of her words, we interpreted it as program should align with the organizational strategy in order to achieve success. So a code was assigned for this paragraph as "strategy alignment". And we did similar coding for the rest of the data she provided in order to generate other codes.

For the second interview, we used the same method to identify codes from the interviewees' words. Then we compared the codes from the second interview with the first interview to identify whether there are codes with similar connotation that can be put into a broader category or whether new codes emerged. For example, still for the question of key success factors, the second interviewee said:

> *…keep in line with the approach and strategy in our company, that's why we try not to make the process too long, if it is long, it is easily to deviate from the strategy.*

This sentence from the second interviewee also stresses the importance of aligning program process with organizational strategy. So the code "strategy alignment" originally generated from the first interview can still cover the meaning of this sentence. Then a thought of developing a category which can be used to include all the codes related to strategy was come up with. We decided to continue using the name of "strategy alignment" for the category.

Beside this, new aspects came up in the second interview. For example, this interviewee talked about program process should not be ignored, he said:

> *…make the process short and very clearly defined, create very good milestones, program tasks should be defined very detailed when program set up.*

Program process was not mentioned by the first interviewee. So it is a new code generated from the second interviewee, we labeled it as "process". The interpretation for this is the first interviewee was a program manager of a business change program, whereas the second interviewee was a program manager of an engineering program. The different nature of programs determined the different concern about the program.

The same analytical procedure was used for all the following interviews. Through constant comparison of the fifteenth interviews, it was found that all the codes in the fifteenth interview can be traced back to the codes or categories generated in the previous interviews. The interview process came to an end here.

Then all codes and categories were reviewed to check whether they made sense to explain the concepts of program context and program success in the research model, whether they could contribute to build constructs and measurement scales for these two concepts for the future quantitative study. If these questions could not be answered, we went back to our raw data, recoded them and repeated the analytical process until a satisfactory answer was achieved.

The results from the data analysis are shown in the Analysis and results section.

3.5. Validity and reliability

Through the analytical processes described in the previous section, research findings can be drawn out of the raw data, but how to make sure the emerging research findings are credible? We followed the quality checklists for qualitative study suggested by Miles and Huberman (1994) to inspect the analysis processes and the results. According to the present qualitative study, the reliability and validity are assured by considering the followings:

- Reliability
  - ➢ Interview protocol was reviewed by peers and supervisors
  - ➢ Data were collected from various industries and countries
- Internal validity
  - ➢ Data were well linked to the categories of theory
- External validity
  - ➢ Sampling diversity to encourage broader applicability
  - ➢ Findings are partly supported in existing theory

4. Analysis and results

This section is structured in five parts: program context, program success criteria, program success factors, program manager's leadership competences and program manager's leadership style.

4.1. Program context

Mainly based on the interview data analysis, together with research results shown in Table 1, three aspects to look at program context were identified. In each aspect, there are several sub-aspects. Some sub-aspects have their constitutional components. These sub-aspects and their components form the basis to further develop constructs for the concept "program context" in the research model (see Fig. 2).

In the text below the sub-aspects and their components (see Table 1) which were generated from the interviews will be explained. First is the "program size" sub-aspect under "program type" aspect. Second is the "scope of the program context" aspect. Third is the "nature of the program context" aspect.

4.1.1. Program size

In the "program size" sub-aspect, programs are categorized as "Small", "Medium" and "Large". When we were conducting the interviews, we asked the interviewees how they judged program size. They gave us their criteria and magnitudes. For example, if they stated budget is a criterion to judge program size, they would also be asked the thresholds in terms of the amount of money for each category, which means how much money as budget assigned to the program making it being considered as small, medium or large. However, the intention of data collection in the beginning was to collect rich variety of

Table 2
Criteria used by interviewees to rate the program size.

Interviewees\ Criteria	Budget	Time	No. of people involved	Complexity	Impact
1	√		√		
2	√	√			
3	√				
4	√	√	√		√
5		√		√	
6	√				
7				√	√
8				√	√
9				√	√
10		√			
11	√				√
12	√				
13	√			√	
14	√			√	√
15				√	

Table 1
Program context constructs.

Concept	Aspects	Sub-aspects	Components	Source
Program context	Program type	Application area	Engineering IT Organizational change	Turner and Müller (2006)
		Configuration	Portfolio Goal-oriented Heartbeat	Pellegrinelli (1997)
		Change-driven	Vision-led Emergent Compliance	OGC (2007)
		Size	Small Medium Large	Interview
		Timeline	Temporary Semi-permanent	PMI® (2006)
		Lifecycle stage	Pre-program set up Program set up Establishing a program management and technical infrastructure Delivering the incremental benefits Closing the program	PMI® (2006)
	Scope of program context	Parent organization Outside parent organization		Interview
	Characteristics of program context	Stability Support Harmony Interaction		Interview

information to generate as broad as possible opinions from practitioner in case not to miss information. So the interviewees were coming from various industries. We found that the criteria sometimes were the same in different industries, but the thresholds changed dramatically depended on the nature of industries. For example, there was one interviewee from a tobacco manufacturing company. In his company, they use budget to judge program size. If the budget was lower than 1 million, it was a small program, and if it was higher than 3 million, it was a large program, and if it was in between 1 million and 3 million, it was a medium one. But the other interviewee from an oil & gas company who also stated budget was the criterion to judge program size, however, he had extremely different thresholds, which were lower than 500 million was small program, higher than 2 billion was large program, and medium was in between. So we cannot compare the criteria thresholds among our interview data. What we did was trust in our interviewees' judgments on their program size. If the interviewee claimed his/her program was a large program in the company, then we categorized that program as a large program. Table 2 shows the criteria to judge program size from the interviewees.

4.1.2. Scope of the program context

The second is the aspect of "scope of the program context". We had no predefinition about program context, so we asked the interviewees how they defined program context, what constituted of program context in their practical lives. We preclassified program context into two sets, the parent organization of the program and the environment outside parent organization. Interviewees supported our grouping for program context and provided examples for it, such as "the program context within the parent organization" contains top management or steering committee of the company, the other programs and projects in the company, the functional departments in the company etc.; "the environment outside the parent organization" contains stakeholders of program, outside networks, public etc. these results helped us to understand the constitution of the program context.

4.1.3. Characteristics of the program context

The third is the aspect of "characteristics of the program context". We asked our interviewees how program context influence their programs. We used inductive coding to disaggregate data, as described in data analysis method section. We found the following four categories:

- Stability of the program context
- Support from the program context
- Harmony of the program context
- Interaction between program context and the program

We analyzed these four categories and thought that they illuminated the characteristics of program context. The stability of the program context contains the stability of the organizational structure, policy, process etc. and the stability of the outside political, economic environment, the relationship with program stakeholders etc. The support from the program context includes top management support, resources availability for the program, organizational learning in the parent organizations etc. The harmony of the program context reflects the good relationship with top management, functional departments, stakeholders etc. The interaction between program context and program represents the fit between program context and the program.

These results provide us with the constructs of program context. Program context constitutes program typology, scope of the program context and characteristics of the program context. Based on these constructs, measurement scales for *program context* can be developed. For example, we can use Likert scales to measure the characteristics of the program context, such as using scales from 1 to 5 (representing the opinion from very negative to very positive) to measure how supportive the program context was etc. This will greatly contribute to the subsequent questionnaire design in the subsequent quantitative study.

4.2. Program success criteria

We used the coding method described in data analysis method section and developed the codes on program success criteria from our raw data. For example, the codes we developed from the first interviewee were: Customer satisfaction, Time, Budget, Milestone completeness. We analyzed these codes, based on Shenhar et al. (1997, 2000) and Turner and Müller's (2006) project success criteria model, and considering the distinctiveness of programs, we grouped these codes into six categories, which form the constructs for program success:

- Business success
- Stakeholder satisfaction
- Program efficiency
- Preparation for the future
- Social effects
- Impact on program team

Table 3 shows these categories and their included codes and counted how many times these codes within each category were mentioned by interviewees. Sometimes several codes mentioned by an interviewee belonged to one category, so the times of the codes were mentioned by interviewees can be more than the number of interviewees, and that is the reason why in Table 3 "Times mentioned by interviewees" can be 21, greater than the number of interviewees, which was 15.

Table 3 shows the results of program success criteria based on the fifteen program managers perceptions. Categories of *business results* and *stakeholder satisfaction* were the two most often mentioned program success criteria by interviewees. The results echo what Thiry (2004) suggested that project management is subjected to a performance paradigm, based on short-term tactical deliverables, while program management proves its ability to deliver strategic change or synergistic benefits.

Beside this, success criteria of some programs are not only related to benefits realization for their parent organizations, but also

Table 3
Program success criteria.

Category	Code	Times mentioned by interviewees
Business success	Increase sales, value creation, benefits realization, follow-up mission, reputation, brand, strategy achievement, operations, revenue, objective	21
Stakeholder satisfaction	Customer satisfaction, customer loyalty, customer resource, stakeholder satisfaction, sponsor satisfaction	12
Program efficiency	Efficiency indicators like time, cost, quality, functionality	9
Preparation for the future	Change the way of doing business, build standard, new technology, talents, influence in the specific industry, future	8
Social effects	Quality of life, environment, safety, science-technology development, Social economic benefits	5
Program team	Team building, good interaction within program	3

related to citizen's livelihood or scientific development. For example, one of our interviewee comes from an urban development program which is building large infrastructures for public. He stated that the social economic benefit was one of the most important success criteria in his program. Another interviewee comes from the defense department of the government, who was the program manager of a spaceship R&D program, stated that to promote the development of science and technology in aerospace industry in his country was one of the most important success criteria in his program. So the social effect is concerned as a success criterion for programs which might be another difference from project success criteria.

4.3. Program success factors

We asked our interviewees for the key success factors in their programs. We did the similar coding for success factors as we did before for success criteria. Then we categorized these codes. For example for the first interviewee, we grouped the codes into five categories, which were culture, program manager, stakeholder/collaboration, process and plan. In the end we got nine categories (Table 4), and then we calculated how many interviewees mentioned each category.

The data showed that program manager was the most important success factor in program management, which supported our research model. Besides, based on our "program context" results, we considered that both the categories "stakeholder/collaboration" and "Networks/context" belonged to the concept "program context". So program context as a success factor was mentioned by 13 interviewees. It was also one of the most important success factors. This result also supported our research model of the larger study.

Table 4
Times of each category mentioned by interviewees.

Program success categories	Number of interviewees who mentioned this category
Program manager	11
Stakeholder/collaboration	10
Networks/context	3
Strategy/goal alignment	7
Process	5
Plan	5
Team	3
Resources	2
Culture	2

4.4. Program manager's leadership competences

Now we knew program manager is a key success factor in program management. Then we need to learn what leadership competences are important for program managers. In our interviews, we used fifteen leadership competence dimensions (LDQ, Dulewicz and Higgs, 2003) to ask the program managers to rate the importance of each leadership competence from low to high by giving a score from 1 to 3 as used by Turner and Müller (2006), see Table 5. The first column in Table 5 is the fifteen leadership competences categorized into three groups, Intellectual Competences (IQ), Managerial Competences (MQ) and Emotional Competences (EQ). In the first line of Table 5, the numbers 1–15 represent 15 interviewees. Corresponding to each interviewee and each leadership competence is the score the interviewee rated the importance for each competence. The first four interviewees didn't give scores for the 15 leadership competences, because in the early phase of our interviews, we didn't include the rating of the 15 leadership competences as part of our interviewees. Our research underwent a continuous revision and improvement process.

As shown in Table 5, the competences "Strategic perspective" "Engaging communication" and "Intuitiveness" received the highest average score. So in our sample, program managers rated these three leadership competences as the most important competences for the role of program manager.

Turner and Müller (2006) also used the LDQ when they did their research on project manager's leadership competences. They interviewed the managers of project managers and asked them to rate project managers' leadership competences, also based on the fifteen leadership dimensions in the LDQ. Table 6 compares the leadership competences, of Turner and Müller's (2006) study on project managers and the present study's results on program managers in terms of their IQ, MQ and EQ needs.

We found that for each group of leadership competences, program managers' rating was higher than project managers', especially for IQ. We interpreted the result in a way that program managers usually manage more complex endeavors than project managers, so they need to have higher levels of

Table 5
Ratings of leadership competences.

Leadership competence	Rate	Average group	Average competence	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Intellectual competences (IQ)		2.8																
1. critical analysis and judgment	H		2.6					3	2	3	3	3	3	2	2	3	3	2
2. Vision and imagination	H		2.8					3	3	2	3	3	2	3	3	3	3	3
3. Strategic perspective	H		2.9					3	3	3	3	3	2	3	3	3	3	3
Managerial competences(MQ)		2.6																
4. Engaging communication	H		2.9					3	3	3	3	3	3	3	3	3	2	3
5. Managing resources	H		2.6					2	3	3	3	1	3	3	2	2	3	3
6. Empowering	H		2.6					3	2	2	3	3	3	3	2	2	3	3
7. Developing	M		2.3					3	2	3	2	3	3	2	1	2	3	2
8. Achieving	M		2.5					2	2	3	3	1	3	3	2	3	3	2
Emotional competences (EQ)		2.5																
9. Self-awareness	M		2.5					3	2	2	3	2	3	1	3	3	2	3
10. Emotionalresilience	L		2.0					3	1	3	2	1	3	1	2	2	3	1
11. Motivation	M		2.5					2	2	3	3	3	3	2	1	2	3	3
12. Sensitivity	H		2.6					3	2	3	3	2	3	2	3	3	3	2
13. Influence	M		2.5					3	3	3	2	1	2	3	3	3	3	2
14. Intuitiveness	H		2.9					3	3	3	3	3	3	3	3	2	3	3
15. Conscientiousness	M		2.5					2	1	3	3	1	3	3	2	3	3	3

leadership competences in any aspect than project managers, especially in IQ. The results echo what Turner and Müller (2006) and Müller and Turner (2010) found that in high complexity projects, project managers scored high in all fifteen leadership competence dimensions, whereas in medium and low complexity projects, not all the fifteen leadership competence dimensions were scored as high by project managers.

4.5. Program manager's leadership style

During our interviews, we asked the interviewees to give us some keywords about their leadership styles. The most frequently appeared keywords were: involving, supportive, work together, give people responsibility, give authority. They told us that basically they were democratic leaders, but when their programs were: a) approaching a critical point in time, and they need to make a quick decision; or b) when coming to the end of a stage, and they needed to review the previous stage and authorize the next stage, then they became more directive. So program managers' leadership style seemed to be contingent on the program situation, or in other words, program context. The results supported the research model that program context plays a role in program managers' leadership competences.

However, three interviewees insisted that their leadership styles were relatively stable: the "directive" styles, because that was their personality, and the personality is not easy to be changed no matter what program context is. So the moderating impact of program context on the relationship between leadership competences and program success, which is shown in the research model (Fig. 2), is needed to be tested in the subsequent quantitative study.

Table 6
Comparison of leadership competences between project and program managers.

Leadership competences	Project manager	Program manager
Intellectual competences (IQ)	2.1	2.8
Managerial competences (MQ)	2.4	2.6
Emotional competences (EQ)	2.4	2.5

5. Conclusions

In this qualitative study, we interviewed fifteen program managers from seven industries in China, Sweden, The Netherlands and the UK. An inductive approach was used to analyze the interview data. Data analysis results helped us achieve the research aims as:

- Developing the constructs for *program context* and *program success*. This will contribute to the questionnaire design in the subsequent quantitative study. The constructs for *program context* include program typology, the scope of program context and the characteristics of program context. The constructs for *program success* include business success, stakeholder satisfaction, program efficiency, preparation for the future, social effects and impact on program team.
- Understanding the leadership competences of program managers. Three leadership competence dimensions, *strategic perspective*, *engaging communication* and *intuitiveness* were perceived to be the most important competences for program managers. The requirement of leadership competences for program managers seemed higher than that for project managers in all leadership competence groups, namely IQ, MQ and EQ. Program managers' leadership styles were contingent on program context.

These research results qualitatively validate the research model, that is, there are indications for a positive relationship between program manager's leadership competences and program success, and program context appears to play a role in this relationship.

5.1. Practical implications

The practical implications derived from the results are:

- Program managers should more focus on *business results* and *stakeholder satisfaction* in their programs as both are the most often mentioned program success criteria. Some programs should also take social effects into consideration.
- Program managers should understand the particular context of their programs and match their leadership styles to the program contexts.
- Top management should take consideration of individual's leadership competence profile and program contextual factors when assigning program managers for the programs in their organizations.

5.2. Theoretical implications

Leadership contingency school emphasizes leaders should match their leadership style to their particular situations. Different context requires different leadership style. The results of the qualitative study verify the leadership contingency theory. In our interviews, program managers stated that they adopted different leadership styles when their program context changed.

5.3. Strength, weakness and suggestions for future study

The present study's strength is collecting data from various industries and countries to cover rich information to develop the constructs for the un-predefined concepts, such as *program context* and *program success*. Based on these constructs, the upcoming quantitative study can be designed and conducted.

However, the present study is based on interviews with a small sample size, and the results cannot be generalized. A future study should be conducted world-wide with a large sample size to test these results.

Appendix 1. Interview protocol

1. Nature of the company and nature of the program done by the company
   - What sort of work is done in your company?
   - What programs you are doing now?
   - What is the size of your program? (budget of the program, timeline of the program, number of projects, people involved, technology involved etc.)
   - What's the criterion to judge program size in terms of small, medium and large in your company or your experience in managing programs?
   - What categories of programs are undertaken (compared with Table A1)?

Table A1
Categories of program types.

Application	Configuration	Change-driven	Size	Time line	Life-cycle stage
Engineering	Portfolio	Vision-led	Small	Temporary	Pre-program set up
IT	Goal-oriented	Emergent	Medium	Semi-permanent	Program set up
Organizational change	Heartbeat	Compliance	Large		Establishing a program management and technical infrastructure
					Delivering the incremental benefits
					Closing the program

Notes: 1. In configuration column, *Portfolio programs* are those which enable the grouping of projects which are relatively independent of one another but have a common theme, the theme can be common resources or technology etc. *Goal-oriented programs* are those which enable the management of initiatives or developments outside the existing infrastructure or routine, which means create new things to achieve the strategic goals. *Heartbeat programs* are those which enable the regular improvement of existing systems, infrastructure or even business processes, via increments to functionality or occasionally an overhaul of the system or facility itself (Pellegrinelli, 1997).
2. In change-driven column, *vision-led program* tends to deliver a clearly defined vision or desired changes focusing on innovation or strategic opportunity. *Emergent program* is a coordination of the projects which have already existed but not coordinated before to deliver the desired changes and benefits. *Compliance program* is referred to as "must do" program to meet the legislative change or to avoid negative implications (OGC, 2007).
3. In time line column, *temporary program* is a temporary organization aiming to achieve a defined benefit by a specific date. *Semi-permanent program* has no defined end date, including not only projects, but also operational processes. It remains active as long as there is a market for the product or service it produces (Müller, 2009, PMI, 2006).

2. Program success (criteria)
   - How do you judge success of your program? What criteria you use? What are the measurement scales?
     - ➢ Qualitative
     - ➢ Quantitative

- What are the thresholds for success/failure in your program?
- Is there any differences in program success criteria over different time frames? That is, in your program, are the success criteria the same at the end of program, in the months following program completion and in the years following program completion? And what's the difference?
- What's the difference of program success criteria by different stakeholders in your program? The stakeholders may comprise of program investor or owner, program director, program manager, business change manager, program team member, program management office, program governance board, consumers, operators/users, project executive, project manager and project team, senior supplier, other suppliers (goods, materials, works or services), public etc.

3. Program success factors (internal)
   - What do you think are key factors in your current program for achieving program success?
   - Do you think program success factors are influenced by the type of program? How does it happen and to what extent?
   - What competences do you think you need to have to achieve program success in your current program?
   - What's the leadership style you adopt in your program?
   - Do you think your leadership style is influenced by the type of program? And how does it happen?
   - Can you grade the importance of the fifteen personality characteristics in Table A2 as a program manager (see attached document for detailed explanation for these fifteen characteristics)?

Table A2
Relative importance of the program manager's characteristics.

Competency	Low	Medium	High
1. Critical analysis and judgment			
2. Vision and imagination			
3. Strategic perspective			
4. Engaging communication			
5. Managing resources			
6. Empowering			
7. Developing			
8. Achieving			
9. Self-awareness			
10. Emotional resilience			
11. Motivation			
12. Interpersonal sensitivity			
13. Influence			
14. Intuitiveness			
15. Conscientiousness			

4. Program context (external)
   - What factors do you think from outside of the program influence the success of your program?
     - ➢ Parent organization
     - ➢ Outside the parent organization
   - How does the influence of these contextual factors differ by different type of program?
   - How much the program manager can influence these factors?

5. Anything else
   - Is there anything else you think significant for program management?

Appendix 2. Interview data overview

No.	Title of interviewee	Nature of Company	Country	Nature of work in the company	Nature of program work	No. of projects in program	No. of people involved in the program	Duration of the program	Size of the program
1	Program manager	Retailer company	Sweden	Create and sell household items e.g. furniture, decorations	IT infrastructure, business change	17	Approximately 250	3 years	Medium
2	Program manager	Manufacturer of integrated packing and distribution	The Netherlands	Produce, package and distribute cigarette	Business improvement	3	3–10 people for each project	Half a year to 3 years	Large
3	Mega-project manager	Design, construction and consultancy to Oil and Gas Industry	The Netherlands	Provide design, consultancy and construction for Oil and Gas production projects	Construction	4	Nearly 2000	4–5 years	Large
4	Program manager	Business and management consultancy to construction projects	The Netherlands	Provide business and management consultancy to infrastructure projects, urban development projects and environment	Research program	2	20 partners, 18 supervisors in board in each organization	2 years	Large
5	Program manager				Construction	Many	Many	10 years	Large
6	Program manager			housing projects	Research program	7–8	20–25	3 years	Medium
7	Program manager	R&D and production base for spacecraft	China	R&D in spacecraft system and subsystem, production, environment test, ground equipment and related service and support	Spacecraft R&D and production	–	–	3 years	Large
8	Deputy program manager				Spacecraft R&D and production	–	–	3 years	Large
9	Assistant of program manager				Spacecraft R&D and production	–	–	3 years	Large
10	Program manager				Satellite R&D and production	–	–	–	Medium
11	Program manager	Trading company	China	Financial service and mineral industry	Financial service design	5	200	7 years	Large
12	Director of PMO	IT company	China	IT system integration and R&D in software	IT system integration	3	70–80	9 months	Large
13	Senior program manager	Managing consultancy	The UK	Managing consultancy in project & program management, change management	Management consulting for railway construction program	7	Over 200	9 years	Large
14	Senior program manager	Air traffic control agency	The UK	Air traffic control services in the UK	Merge four air control centers into a consolidated one	30	120	6 years	Large
15	Senior program manager	Government department	The UK	Responsible for funding highway, road, and any form of transport.	West coast main line in the UK	Hundreds of	200	7 years	Large

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