Chapter 8
Conclusions and Discussion

In this chapter, I will briefly summarize the findings of my study and integrate the various parts of it. There are, however, also a number of limitations and implications for further research. These will be addressed as well. Finally, I will discuss some practical applications and propose a renewed model of team development.

8.1 Team Responsibilities, Responsiveness and Results

In the introduction chapter I started with a simple input-process-output model of team development. In the subsequent chapters I filled in this model step by step, focusing firstly on the process element of the model and secondly on connecting this to outputs and inputs.

In total, this study was built around three main research questions:
1 Team responsiveness: how can the team developmental processes be described?
2 Team results: what are the effects of the team responsiveness on business performance as well as on quality of working life?
3 Team responsibilities: what are the management structure’s inputs that generate team responsiveness?

In the following sections I will summarize the study’s outcomes and discuss the overall model.

8.1.1 Team Responsiveness

The first research question of this study centered on the developmental processes of teams: team responsiveness, defined as “the group process of self-management in terms of actions and behavior in relation to given responsibilities (tasks, goals and challenges, desired outcomes)”. A number of approaches and theories coexist in the literature. There are prescriptive models for the development of teams in sequential phases (Katzenbach & Smith 1993) as well as descriptive models
describing general team processes as recurring phases (Marks, Mathieu, & Zaccaro 2001). Both of them, however, lack a sound tradition of “in-context” empirical basis. A third approach sees teams developing in different simultaneous processes and relates these to the outputs of teamwork (Dunphy & Bryant 1996). Although this approach comes close to mine, its empirical support is only limited to a study among sales-teams, carried out by Gladstein (1984). Reviewing all this literature resulted in a list of 12 key-aspects of team responsiveness that were found across the various theories and approaches; these were then “combined” by a factor analysis into three dimensions of team responsiveness:

Joint management indicates the intra-group focus of the team, with aspects such as goal orientation and conflict management.

Job management refers to the team’s task focus by aspects such as multi-functionality, and decision making and control.

Boundary management refers to the team’s management of external relationships, such as with customers, and to continuous improvement activities.

Over time, teams at Volvo appeared to develop simultaneously backwards and forwards on these dimensions and certainly not in any clear sequential order. No support for the phase or recurring phase theories was found.

More important is that so far no study has been performed that empirically links team responsiveness with team results, and this concerns the second research question.

8.1.2 Team Results
The second research question focused on the relationship between team responsiveness and team results. I formulated a number of hypotheses and used both subjective and objective measures as indicators on business performance (BP) and quality of working life (QWL). The effects of team responsiveness on these indicators were considered both cross-sectionally and longitudinally. Cross-sectional analyses show the direct effect of a certain dimension on the team results, in other words, the effect of today’s level of job, joint and boundary management. The longitudinal analyses show whether these effects are sustainable over time.

The data show that there are no general tendencies, as hypothesized, that:

- Joint management would have positive effects on all BP and QWL measures (hypothesis 1 and 4)
- Job management would have a positive main effect on all QWL measures (hypothesis 2 and 5)
- Boundary management would have a positive main effects on all BP measures (hypothesis 3 and 6)
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However, the team responsiveness dimensions show clear and positive effects on all measures and the results are much more nuanced instead. The relationship between the dimensions and specific results are very diverse, with each dimension affecting different results.

Boundary management showed the strongest effects on both objective and subjective performance criteria. Product quality and short-term sick-leave are largely affected by boundary management, as are satisfaction, involvement and burnout, which gain long-term and direct effects from it.

Job management shows to be highly relevant for the level of costs and to a smaller degree for product quality. Job management also positively affects all three attitudinal measures.

Joint management does not have the impact on all measures as expected. Nevertheless, this dimension clearly contributes positively to the level of utilization, long-term sick leave and both satisfaction and involvement.

The hypothesis that the longitudinal models of team responsiveness have an important main effect on team results and that adding cross-sectional effects would therefore not explain much extra variance (hypothesis 7), is supported by the data. The longitudinal models proved to be good predictors for all measures of QWL and utilization. Hence, all effects can be considered as positive and quite strong, especially considered the fact that I tested the relationship between subjective measures of team responsiveness and the objective measures of business performance and sick leave.

8.1.3 Team Responsibilities

The third research question was an explorative one and focused on the relationship between the management structure of the team-based organization and team responsiveness. The organizational structure external to work teams has received little attention in the literature. Since the body of knowledge in this field is limited, I made an attempt to contribute by diagnosing Volvo Umeå’s management structure and tracing my data on a number of theoretical notions.

The key elements of the diagnosis are the complexity of crucial regulation tasks and the location of expertise and authority for these tasks within the organization. The result indicates the kind and distribution of regulation tasks within the Volvo organization, in other words, the kind of tasks delegated to teams and the percentages of expertise and authority located on different hierarchical layers.

The complexity of tasks appears to have no relationship with the location of authority and expertise (hypothesis 8), meaning that regulation tasks are located on all possible organizational levels, no matter how complex these tasks are.

Relating the location of authority and expertise to responsiveness shows that teams generally increase responsiveness if they have the responsibilities (authority
and expertise) for a larger number of tasks (hypothesis 9b). However, unlike much of the literature propagates, teams do not respond better to simply all authority and expertise in the same way (hypothesis 9a). Some regulation tasks, such as product development and production engineering, affect the team processes positively only if they are located higher in the organization. Therefore, the proximity of authority and expertise to teams is of importance, yet should be regarded differently for each regulation task.

This part of my study provides two important suggestions:

• Teams generally reach higher responsiveness when a larger number of regulation tasks are delegated to them, however,

• not all tasks should be located on team level.

8.2 Three R’s: A Model for Team Development

This section resumes the overall conceptual model of team responsibilities, team responsiveness and team results, summarizing the most important empirical relationships (see Figure 12).

The 3R-model depicts the overall concept of team development as an integrative approach towards inputs, processes and outputs of teamwork. It describes only the most important results, thus avoiding the use of too many lines and arrows. Almost all of the arrows shown in this figure describe longitudinal relationships, which indicates the importance of using team development as a longitudinal approach.

The management structure forms the set-up of the team-based organization with responsibilities. Expertise and authority for regulation tasks can be delegated to teams or are located elsewhere in the organization. This approach creates a maneuvering space for teams. As a reaction, teams show a certain responsiveness on three dimensions: job, joint and boundary management. These dimensions are process variables on which teams can develop simultaneously. Each of these three dimensions has clear cross-sectional and longitudinal effects on measures of BP and QWL. The result is an overall model of team development: team results are the ultimate goal and output of team responsiveness, a process that is enhanced by the inputs of team responsibilities. When developing teams towards better results, attention needs to be paid to all three aspects of the model.
Figure 12  3R-model: overview of the study’s most important relationships
8.3 Strengths, Weakness and Further Research

To provide insight into the limitations of this research, I will refer to both the strengths and weaknesses concerning the way this study has been set up and carried out and its results were interpreted. Next, I shall discuss some issues for further research.

8.3.1 Strengths

Few studies had available such a large data set as I collected. A strong empirical basis is unfortunately lacking in most of the literature in the field of teamwork. More than 150 teams were included and more than 1500 employees and managers actively participated in this research.

A second strength of this study is its longitudinal character. Three measurements were carried out among the same teams and the same managers during a three-year period. This enabled the consideration of longitudinal effects and the comparison of these with cross-sectional effects, as they are usually regarded in team studies.

A third strength is the use of objective performance data, such as product quality, costs and sick leave. Most studies are limited to the use of self-reported performance or perceptional measures. The use of comparable objective measures was possible through the collection of data within one company, whereas objective measures used in different organizations are often less comparable.

The fact that the study was not only explorative, but also theory testing is a fourth strength. Generally, many assumptions are used in models and practice of teamwork. In this study a few of these assumptions were tested and it seems that some effects are much more nuanced than often put forward.

A final strength of this study is the use of different data collection methods for each part of the model. The responsibilities were measured with the team managers, the responsiveness was measured with the team members and most results were measured objectively.

8.3.2 Weaknesses

A weakness of the study is that it has been carried out within one organization and within one country only, and therefore raises questions about the generalizeability. We may wonder if the type of teamwork at Volvo is comparable to that at other organizations. However, the fact that at Volvo a variety of production and service teams operate in very different processes makes it likely that similar outcomes of team responsiveness and its effects will be observed in industrial sites elsewhere. By including service teams from supporting departments and statistically controlling
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for their difference with production teams, similar behavioral and attitudinal outcomes may be expected in other organization types than industrial types alone.

Another weakness is the explorative character of team responsibilities, which regarded only production teams within one organization. A method to collect data about responsibilities had to be developed from scratch. Doing so has its limitations, but provides valuable new inputs for further research. Since the defined list of regulation tasks may be specific for work teams in industrial organizations, it could still gain from further validation in other types of settings. However, the generally applicable approach for the location of expertise and authority, defined by the total number of delegated regulation tasks, may be useful in all types of team-based organizations.

8.3.3 Further Research

This study has provided new insights into the developmental process of work teams, its results in terms of both BP and QWL, and its required inputs, defined as responsibilities. The collected data set is extensive, and the outcomes provide interesting perspectives for further research with the same data set as well as further validation of the model in other settings.

First of all, the here presented model could be tested in other team-based organizations. The service industry comes to mind, where teamwork is widely applied as well. Besides banks (Stoker 1998) and the Dutch tax-office, healthcare organizations are also introducing team concepts (cf. Schouteten 2001).

Secondly, with the present data set the model might gain from (1) testing the mediating effect of responsiveness on the relationship between responsibilities and results. Interaction effects (2) of team responsiveness dimensions on outcome variables are valuable to consider as well. So far the study is presented with a one-way model as its basis. However, many social processes and their outcomes are “reinforcing” and therefore it may be of interest to also consider the feedback-loops (3) of team results on team responsiveness, and that of team responsiveness on team responsibilities. Finally, (4) numerous other (statistical) methods are available to approach the same conceptual model in various ways, and they could all provide interesting perspectives.15

Thirdly, the here proposed model also might be further elaborated. Especially the inputs to team responsiveness can easily be elaborated, including aspects such as leadership, task characteristics, group composition and tenure. Concerning the

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15 E.g. I have seriously considered the option of multilevel analysis and even participated in a few courses. Unfortunately, the structure of my longitudinal data set even appeared to be too complex for multilevel experts at the University of Twente to deal with all issues of my model. However, some aspects might be interesting enough to test with a cross-sectional multilevel model.
effects of personal characteristics, a start has been made by studying the effects of different personalities on team responsiveness (Varenik, Kuipers, & De Witte 2004), and other topics are on the agenda as well.

8.4 Applications of the 3R-model

The practical implications of the research outcomes are also relevant. In this section, I will suggest a new approach to team development using the model I developed. I will first discuss the difficulties of the practical use of phase theories, after which I will introduce an alternative approach and subsequently discuss a few important steps to be taken for this.

8.4.1 Limitations of Phase Theories for Practical Use

The most common models and approaches used for the development of teams are the earlier introduced sequential phase models. Using such an approach basically means starting at phase one and working to improve until the end of this phase, after which a start can be made with the next phase. The hypothesis is that teams are high performing only after going through all phases. But what is “high-performing” in the final phase? How much time and resources need to be invested until this final phase has been reached? For example, Van Amelsvoort and Benders (1998) indicate that most teams they observed do not reach phase three (out of four). And if teams can empirically be positioned in several phases simultaneously (Hut & Molleman 1998; Kuipers & De Witte 2005a), on which phase should be focused then?

The alternative suggested by recurring phase theories (Gersick 1988; 1989; Marks, Mathieu, & Zaccaro 2001) approaches the developmental process in a more flexible way. The authors put a very clear result at the end of the development cycle when the deadline is reached. However, as argued earlier in 2.2.4, work teams on the shop floor usually do not have such deadlines on a longer time-perspective, as meant by these authors. Instead they need to produce and service repetitively. The models developed by Gersick (1989) and Marks et al. (2001) are also not based on empirical studies among work teams, but rather on studies among groups of students and teams in laboratory settings. Although these theories provide valuable perspectives and a more nuanced view on group processes, they do not meet the practical demand of organizations to develop teams towards improved performance.

Despite the clear guidelines, the easy to follow thinking and the elaborated toolboxes that models such as developed by Katzenbach & Smith (1993) and Wellins et al. (1991) offer, the impression arises that the developmental process of teams has become a goal in itself. Team results on the other hand, for which teamwork (probably and hopefully) has been implemented, seem to be rather undefined effects that will be reached at a rather undefined moment in the future.
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As I propagated throughout this dissertation, teamwork or team development can never be a goal in itself. Increased BP and improved QWL is what is really aimed at, and therefore results need to be the starting point of the development process.

8.4.2 Starting Team Development from the Results Perspective

If improved results are the aim of teamwork, then why not start from the perspective of results? For such an approach it is useful to apply the model presented in 8.2 but now ... backwards. Only after determining the performance needs can one be aware of what processes need to be focused on to reach this performance. An organization like Volvo Umeå might first define the key-performance indicators (KPI's) and subsequently determine the responsiveness dimensions that need to be developed to reach these KPI's. Finally, it can decide for which regulation tasks expertise and authority can be delegated to the team so as to increase its responsiveness. Applying this approach does not mean that the development sequence of the phases determines what you are working on, while hoping to reach the desired results some day. Instead, the organization chooses its performance focus and then develops the dimensions that lead to these results. When each dimension has different effects on each of the various results, a phase approach is useless. In the worst case, the desired performance would only be reached in the final phase after all the preceding phases have been developed first. The following example briefly illustrates my alternative approach.

**Example 1**
Volvo Umeå decided that product quality is one of the most important KPI's for the next year. The model indicates that for product quality direct effects can be expected from job management and boundary management. To work on the improvement of these two dimensions, Volvo knows that delegating expertise for a larger number of regulation tasks positively affects job management, whereas for boundary management both authority and expertise are relevant. The tables in 7.4.1 suggest for what tasks expertise and authority can be delegated best, and for which a location on higher organizational levels is desirable.

The following section elaborates this approach in further detail and provides a more extensive example.

8.4.3 Practical Steps for Developing Teams

The previously suggested approach works most precisely when measurements for each of the model's sections are used. A number of steps, comparable to the Deming-circle of plan-do-check-act, can then be taken to create an agenda for team development, which provides both insight into the state of being and the desired outputs of teamwork (see table 47).
Table 47 Steps and Inventory to Create an Agenda for Team Development

<table>
<thead>
<tr>
<th>Step 1</th>
<th>Define key performance indicators (KPI’s)</th>
<th>Determine the least developed KPI’s</th>
</tr>
</thead>
<tbody>
<tr>
<td>Step 2</td>
<td>Link KPI’s to responsiveness</td>
<td>Determine the least developed responsiveness dimensions</td>
</tr>
<tr>
<td>Step 3</td>
<td>Link dimensions to responsibilities</td>
<td>Determine the most important responsibilities</td>
</tr>
<tr>
<td>Step 4</td>
<td>Define an agenda based on the inventory</td>
<td></td>
</tr>
<tr>
<td>Step 5</td>
<td>Work through the entire agenda and return to step 1</td>
<td></td>
</tr>
</tbody>
</table>

8.4.3.1 Step 1: Determine the KPI’s

The first step, as proposed in the previous section, is to define the organization’s KPI’s. These KPI’s are the measuring points of the organization’s strategy and goals. The team-based organization requires insight into each of these KPI’s on team level. It is very hard to know what to develop and how to make teams accountable for contributing to the results, if KPI’s and actual results are only known on and known for higher organizational levels. Each KPI needs to be determined (and measured), communicated and followed up on a regular basis on team level. In this research a number of measures is used that can serve as examples for performance measures in other organizations (see Chapter 3). After determining the KPI’s and measuring them for each team, each team and its manager know the team’s strengths and weaknesses in terms of results. A team may be strong in utilization, but weak in sick leave. Logically, such team will need to focus on the improvement of sick leave, while further development of utilization requires much less attention.

8.4.3.2 Step 2: Measure and Link Team Responsiveness to KPI’s

The following step is to determine which responsiveness dimensions need to be developed to improve the least developed KPI’s. Figure 12 provides insight into these dimensions, but it is still required to determine the team’s responsiveness (the survey developed for this research could be used to measure responsiveness). The same way of thinking holds as for the KPI’s: it is much more effective to put energy into the development of the least developed dimensions that contribute to the preferred KPI’s, than into those that are already well-developed.

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16 How else to feel responsible for the performance, than when the goals are clear and your results and contributions are visible?
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After this measurement has been carried out for each team and each team has determined which results should be focused on, it is possible to determine the 'right' dimensions. By using the theoretical aspects as defined in table 2, the team and its manager can decide more precisely which part of a dimension requires the most attention (see Figure 13).

![Figure 13 Three dimensions of team responsiveness](image)

**8.4.3.3 Step 3: Measure and Link Team Responsibilities to Dimensions**

The next step to be taken is to determine the regulation tasks and to decide which tasks can be delegated to improve the desired dimensions. With the method developed in chapter 6 and 7, the organization can first define the crucial regulation tasks and then determine the location of expertise and authority of these tasks. These tasks can be located all over the organization, at various organizational levels and support functions. This means that deciding to further delegate tasks also involves people at these different locations. Delegating their authority and expertise to teams can be a delicate issue (Van der Zwaan 1999) that requires well-considered change processes and full participation from everyone involved.
8.4.3.4 Step 4: Working on an Agenda for Team Development

After step 1-3 an agenda can be formulated that lists the results that require improvement during the next period, the team responsiveness dimensions that are in focus, and the team responsibilities that can be further delegated.

The development of the responsiveness dimensions, and thereby the team results, can now take place by combining two approaches. First, attention can be paid to a defined dimension by aiming direct actions on the improvement of certain aspects of this dimension (e.g. by use of training, action plans, team discussions, and so forth). Secondly, the organization can work on task delegation, by providing teams with authority and expertise. Leadership is required to make teams accountable for the delegated of tasks (Stoker 1998), to support them in carrying out certain tasks and to follow-up on the task performance. The current experts, such as agents from support functions and managers, can transfer expertise for tasks directly by training and education, or knowledge can be obtained from outside the organization.

Throughout the process of team development each of the aspects on the agenda, the actions, the behavior, the contribution and the outcomes, need to be monitored and followed-up on a regular basis. An example of the use of each step in practice is provided in example 2.

Example 2

Team 7 in the assembly has received its results for the KPI’s as determined by the plant management. It has improved its costs and the team’s satisfaction increased; however, the product quality is still too low and the number of sick-occasions is too high. Together with its manager the team decides to focus on improving the results of both KPI’s during the next 6 months. The manager provides the team members with the outcomes of the team responsiveness measurement and explains how joint and job management have increased and how boundary management went down compared to the previous measurement. The manager uses the weekly team meeting to discuss the connection between the low level of boundary management and the problems with the team’s quality and sick-leave. Since job management has increased in the previous period and has reached a satisfactory level, the main goal for the team is to maintain this level. Therefore, they decide together to look deeper into the figures for boundary management, which contains the largest development opportunity. The customer and supplier relations show to be quite good, while the improvement activities and the advanced managerial & support tasks require extra attention. The manager puts up an action plan for two periods of three months in which they will work on the improvement of quality and on decreasing the number of sick-leaves. For quality improvement a number of technical issues have to be dealt with, such as changing some of the tools. When the team members are using the stools in one of the stations more consistently the number of back-injuries can be decreased. Apart from that, the manager asks the team members to come up with more suggestions to work in a structured way on improvement activities. They come to the conclusion that some team members have to use a more supportive approach to new suggestions. The manager will evaluate this during
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every team meeting for the next three months. Also, every team member can hand in suggestions on paper in advance so that it is ensured that each suggestion reaches the team meeting agenda. Suggestions related to the improvement of quality will receive most of the attention during this six-month period.

With respect to the advanced managerial and support activities, they decide that the manager will involve them much more actively with the recruitment of two new team members. This regulation task has positive effects on boundary management. Besides, two of the team members feel anxious about the changes in the team and involving everyone with the selection of new people might help to reduce the anxiety and thereby the number of sick-occasions.

The total action plan will be used during every team meeting and the results will be evaluated in three months, after which some alterations will be made for the three months following. At the end of the total six-month-period a measurement will need to show if the team managed to improve its level of boundary management and subsequently the product quality and number of sick-occasions.

8.4.3.5 Step 5: Working through the Agenda and Return to Step 1

The most important aspect of this approach is that the focus of team development is always on the improvement of specific results. A number of steps always have to be taken: determine specific KPI’s, link these to the responsiveness dimensions and connect the dimensions to specific team responsibilities. This procedure leads to an agenda for team development, which can be used until the desired performance outcomes have been reached. In the meantime, the process will be evaluated constantly and measurements will be made where appropriate. After these cycles the entire procedure can start from the beginning by defining the next KPI’s to improve.

8.5 Concluding Remarks

Teamwork means a very practical way of working, which desires and demands very workable inputs, processes and especially outputs. Unfortunately, there is little knowledge about how the team development process leads to specific outputs. Science can contribute a lot, even to these very workable needs. In this study, I have illustrated the developmental process of work teams, called team responsiveness, and some of its inputs, called team responsibilities; but above all I have addressed its effects on team results and showed its nuances. Teamwork or work teams are not goals in themselves. I therefore propagate a clear focus on the results of work teams, and the responsibilities and responsiveness of teams to reach these results, in science and in organizations. This study provides a novel approach and new insights for both.