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Lean and Green Management adoption in an Indonesian transportation company: Transformational leadership in an emerging economy context

Master Thesis
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Abstract

To react to the ongoing climate change, the business sector of transportation and logistics, with currently high greenhouse gas emissions, needs to operate more sustainably. Transportation and logistics providers in emerging economies with expected growth rates, like Indonesia, must adopt measurements to cut their carbon dioxide emissions. A joint implementation of lean and green management and a following lean and green practice adoption by transportation company employees, play a crucial part to cut the companies' emissions and be more economically efficient. Thereby, the type of leadership and leadership behaviors are related to employees' intention to adopt lean and green practices. This study aims to explore the relation between leadership and employees' practice adoption by examining 23 in-depth interviews with employees and leaders of an Indonesian transportation company by applying abductive reasoning. During the analysis, 26 code groups and seven overarching themes, which represent the lean and green adoption process in the examined company, emerged. These themes were 'Contextual factors', 'Lean & green enablers', 'Lean & green leadership behaviors', 'Lean & green barriers', 'Employees' views on lean & green', 'Lean & green adoption', and 'Effects of Lean & Green'. The decision of leadership served as a starting point for the company's overall lean and green management adoption. The identified leadership type was transformational leadership, which influenced the employees' lean and green practice adoption, especially enhancing their proactive behavior, and problem-solving abilities. Based on the findings, a conceptual model of lean and green management adoption was established. Practically, the study implies that a basic pathway for lean and green management adoption should be established and be continually revised by decision-makers in a company's change management. Moreover, the study stressed the importance for target-oriented lean and green training and knowledge diffusion. Future research should further explore the type of transformational leadership, its underlying values, and its influence on lean and green adoption.

1. Introduction

As a response to the ongoing climate change, and its severe consequences for life on earth, general environmental awareness has grown over the last years. The United Nations (UN) established seventeen Sustainable Development Goals (SDGs), to be reached by 2030, which aim to improve lives while protecting the planet. Since then, many countries have implemented the SDGs in their national development plans (Thilakshan, 2019). Consequently, legal requirements for sustainability and pressure from consumers have led many businesses to adopt environmental friendly business practices. An increase in environmental awareness would especially have an impact on business sectors, which currently have high-energy consumption levels. Professional logistics and transportation companies are part of a high-energy business sector (Dima, Grabara, & Modrak, 2014). For major economies, transportation efforts are crucially important for distributing goods and are seen as a societal demand area (Rohracher, 2008). Hence, the business sector of logistics and transportation must inevitably implement environmentally friendly practices and decrease the emission of harmful greenhouse gases.

While looking specifically at the context of emerging economies, it appears that these countries have high carbon dioxide emission (CO_2) rates due to economic growth and the impact of their transportation conditions (Lai & Wong, 2012). Between 2013 and 2025 the emerging economy of Indonesia has a projected GDP growth of 4.6% and a population growth of 0.4%. By the year 2017, the Indonesian transportation sector has become the largest energy consumer, accounting for 46.58% of the national energy consumption. With signing the *Paris Agreement* in May 2015 the Indonesian government seeks to reach a vast CO_2 reduction within the upcoming years (Widyaparaga, Widodo, Handika, Setiawan, & Lindasista, 2020). Even though research focusing on green implications in specific industries has gained importance in recent years, studies regarding green practices in emerging markets are still underrepresented (Scur & Barbosa, 2017). Due to Indonesia's prospected economic growth and currently high CO_2 emissions in logistics and transportation, Indonesian companies in this business sector should widely aim at reducing their CO_2 emissions.

Aldakhil, Nassani, Awan, Abro, and Zaman (2018) examined the determinants of green supply chain management in several emerging economies and found a strong positive correlation not only between the country's per capita income and the sustainability of the transportation sector, but also individual socio-economic factors found within a firm. Moreover, Lin and Ho

(2008) investigated the organizational factors that influence the adoption of green innovations and business practices and found strong influences of organizational encouragement and quality of human resources on greener business performance. Also, organizational structures, climates, and cultures are influencing the organizations' adoption of environmentally friendly innovations (Russell & Hoag, 2004). Thereby, leadership behavior significantly influences the adoption of green innovation, and thus a more environmentally friendly business performance (Tornatzky & Fleischer, 1990).

In the past decades, the management practices of *lean and green management* have been adopted by companies with the purpose of creating value through quality products and services (Campos & Vazquez-Brust, 2016) while reducing waste from business operations (Deif, 2011). lean and green Management are two different management streams; while Green is an environmental practice, Lean Management is defined as an economic practice (Campos & Vazquez-Brust, 2016).

Recent studies have shown that lean and green Management can also be seen as synergistic in terms of their focus on reducing waste and economic inefficiency (Carvalho, Govindan, Azevedo, & Cruz-Machado, 2017). The synergistic view proposes that the sum of the values of lean and green management combined are greater than the sum of the values individually (Campos & Vazquez-Brust, 2016). On the one hand, lean management is a non-capital-intensive approach to improve efficiency, eliminate waste, and enhance customer value (Van Dun, Hicks, & Wilderom, 2017). On the other hand, green management looks at the potential of deleterious environmental impacts of the firm and its economic processes and seeks to reduce and eliminate these. Hallam and Contreras (2016) concluded that lean implementation leads to green outcomes, and green objectives mostly require such lean practices implementation.

Practically, while implementing lean and green management, tools such as 5S, kaizen, standardized work or technology adoption, play a crucial role (Gupta & Jain, 2014). However, the adoption of these management practices and accompanied tools requires goal-directed managerial behaviors (Magnani, Carbone, & Moatti, 2019). Thus, organizational leaders play a pivotal role in leading their followers to adopt lean and green practices and consequently contribute to greening the transportation operations.

In organizational contexts, leaders are considered as socially central individuals that can influence employees' adoption behaviors (Hamstra, Van Yperen, Wisse, & Sassenberg, 2014). Organizations are considered as sites of frequent individual learning through initiatives like

trainings, establishing rules and norms, and learning general work patterns (Myers, 2017). The social learning as well as followership theories show how leaders' values and behaviors affect their followers' behaviors, and vice versa. This leads to the assumption that leaders' values, especially self-transcendence and openness-to-change values, influence their team members' and followers' adoption behaviors (Van Dun & Wilderom, 2016), (Van Dun & Kumar, 2021)

Therefore, it is important to explore the leaders' behavior with their followers, which is necessary to sustainably affect Indonesian transportation providers by a wide adoption of lean and green management practices by employees. Here, leadership behavior is defined as specific observable verbal and non-verbal actions of managers in interactions with their followers in the organization (Van Dun et al., 2017). Leadership behavior has been claimed as an important factor for successful lean management implementation (Tortorella, van Dun, & de Almeida, 2020), which enhances the outcome of green management. Also, different national cultures tend to shape the mindset of leading individuals, thus there can be differences in behavior and employee behaviors between cultures (Hofstede, 1980).

Organizational leaders play a crucial role when it comes to the employees' intention to adopt lean and green behaviors and practices. This study aims to examine leadership behaviors during a lean and green management adoption process in an Indonesian transportation company. Moreover, it seeks to unveil the relations that the type of leadership behavior would have to employees of Indonesian transportation providers and their intention to adopt lean and green work practices. Hence, the central research question of this study is: *How does the leadership style of leaders relate to Indonesian transportation company employees' intention to adopt lean & green practices?* Specific leadership behaviors during the lean and green adoption process will be examined by a qualitative study among leaders and employees in a Indonesian transportation provider. Additionally, the firms' employees' behavioral intentions to adopt lean and green practices will be explored. The study aims to discover and generate plausible explanations (Bamberger, 2018) about lean and green leaders' values and behaviors in possible relation to employees' intention to adopt lean and green behaviors and practices. Consequently, we apply abductive reasoning, which merely seeks to generate conjecturable explanations (Bamberger, 2018, 2019). Compared to the more commonly used inductive and deductive reasoning, abductive reasoning is grounded on generating plausible first suggestions about phenomena and their explanations based on observations and extending existing theory (Bamberger, 2019).

The study results seek to add to the sustainable leadership literature and aims to develop insights for an environmentally friendlier transportation performance in Indonesia and other comparable emerging economies.

2. Theoretical Framework

2.1 Lean Management in Transportation & Logistics

Lean management stems from the work of Taichi Ohno in the Toyota Production System (TPS) in the late 1980s (Ohno & Bodek, 2019). The overall purpose of lean management is achieving more customer value, e.g., better cost, quality, and time in product delivery while reducing wasteful process steps, through continuous improvement. Therefore, lean management seeks to eliminate all forms of waste as means to lower the costs and reduce lead times, while maximizing efficiency and effectiveness based on the customer demand (Roosen & Pons, 2013). Here, empirical research shows that the application of lean management and waste reduction has gained importance in road transportation. For example, Sternberg et al. (2013) developed a framework, in which Ohno's seven lean waste reductions are applied to issues in road transportation such as overproduction, waiting, incorrect processing, unnecessary movement, and defects.

In emerging economies such as Indonesia, lean management practices are often adopted to enhance efficiency and ensure organizational prosperity in the competitive transportation market (Jakhar, Rathore, & Mangla, 2018). In recent research, there has been a shift from seeing lean as a purely process-oriented strategy to a human resource management and people-oriented strategy (Magnani et al., 2019).

2.2 Green Management in Transportation & Logistics

It is important that business sectors that have high energy consumption align with the set SDGs to be reached by 2030 (Thilakshan & Bandara, 2019). Main stakeholders of transportation and logistics organizations such as the public media and customers demand organizations to implement more sustainable management practices, often referred to as green management (Schmidt, 2017).

Jakhar et al. (2018) categorize green management as pollution prevention and control practices. Pollution prevention usually attempts to implement fundamental changes that tend to be expensive. These practices include the purchase of greener vehicles, a change toward greener

energy supply, and sustainable warehousing. Pollution control practices, however, attempt to make minimal changes in resource and process structure and imply minimal costs for an organization.

Lin and Ho (2008) argue that organizational factors such as human resource management are centrally important in the adoption of green practices. Also, the quality of human resource management, internal communication efforts, and leadership behavior play an important role in green practice adoption (Tornatzky & Fleischer, 1990). Vachon (2007) argues that organizational knowledge-sharing mechanisms and internal collaboration are crucial factors, which facilitate the overall adoption of green practices, in terms of both pollution prevention and control. In modern transportation and logistics companies, the environmental performance is mostly beginning with the vision and commitment of top-management for green management, support from mid-level management and employees with personnel responsibility or internal consultants, before being adopted by the employees (Zhu, Sarkis, & Lai, 2008).

2.3 Lean & Green Synergy

Combining lean and green practices can positively affect supply chain performance (Campos & Vazquez-Brust, 2016). Puspani, van Dun, and Wilderom (2020) identified four supply chain problems to be solved by lean and green management adoption, vehicle routing problems, smarter package loading, reduce excess distances, and better communication with warehouse operators. In the past, lean and green practices in organizations have been seen as '*parallel universes'* (Larson & Greenwood, 2004). Still today, most studies focus on either one of these practices (Puspani et al., 2020). Recent research however, recognized a possible relationship between these two practices, and lean and green practices became complementary. The combination of lean and green management is an emerging research topic and is expected to grow in the upcoming years (Coutinho, Ceryno, de Souza Campos, & Bouzon, 2019).

Most of the existing papers on Lean and Green synergy emphasized the connection between lean and green being the efficient use of energy (and resources) and the reduction of waste and pollution (Dües, Tan, & Lim, 2013). Hallam and Contreras (2016) see lean and green as almost entirely synergic practices. Moreover, Carvalho et al. (2017) describe lean and green practices as a joint approach of environmental and operations management. These synergies result when the value added to environmental and financial performance by both lean and green, is greater than the sum of the value added by the individual parts (Campos & Vazquez-Brust, 2016).

Despite an uprising synergetic view of lean and green management, research also observed areas where the two management practices seem to conflict. Franchetti, Bedal, Ulloa, and Grodek (2009) pointed out that both paradigms evaluate the nature and environment differently. Whereas lean sees the nature as a valuable resource, green considers the environment as a natural constraint for business practices. Other research, however, weakens this assumption. Lean practices mostly trigger green practices (Martinez, Vazquez-Brust, Peattie, & Zokaei, 2012), but green practices can also help companies to become leaner. Both practices seek to improve quality and time as well as to reduce costs with the final aim to generate a greater turnover value (Gupta & Jain, 2013).

In most papers about lean and green, behavioral factors, which might influence the synergy potential are understudied or weakly conceptualized. Moreover, existing studies remain unclear about to what extent additional value is created when both practices are implemented together, or whether alleged synergies are just parallel implementation with no added value (Campos & Vazquez-Brust, 2016). Despite this, only few examples are available to explain how managers can integrate green practices into existing lean practices (Dües et al., 2013).

2.4 Behavior & Values of Effective Leadership for Lean & Green adoption

The concept of leadership can be defined in aspects of traits, behaviors, influence, interaction patterns, role relationships, and occupation of an administrative position (Ozsahin & Sudak, 2015). In this study, we focus on the aspect of leadership behaviors and its underlying work values in a lean and green management adoption context.

Leadership behavior

Leadership behavior has been claimed as an important factor for successful lean management implementation (Tortorella et al., 2020). In research related to the Managerial Practice Survey (MPS), which examined various types of leadership behavior, three underlying dimensions were found, namely task-oriented behavior, relations-oriented behavior, and the change-oriented behavior (Yukl & Becker, 2006). *Change-oriented behaviors* are related to making decisions, adapting, and including change, increasing flexibility and innovation, making drastic changes in innovating in products and processes. *Task-oriented behaviors* are directed towards the behaviors shown to use human resources and material and enable the performance of operations. *Relationship-oriented behavior* increases teamwork, boost job satisfaction of followers, and ensure integration with the organizational goals (Ozsahin & Sudak, 2015). Based on these three

dimensions, the lean and green leadership behavior can possibly be framed and set into possible relations with employees' lean and green behaviors, which play a crucial role when integrating lean and green practices (Found, Lahy, Williams, Hu, & Mason, 2018). Leadership behaviors in lean and green management aim to encourage workplace pro-environmental and efficiency behaviors by their employees, such as recycling, conservation, and waste reduction. Consequently, these behaviors contribute to the greening of organizations (Robertson & Barling, 2013).

Transformational Leadership

In most recent research in Indonesian transportation and logistics organizations, transformational leadership by middle managers found to be crucial for employees to continuously improve the adoption of lean and green work practices. Top leaders however were mostly engaging in transactional leadership style (Puspani et al., 2020). Transformational leadership is driven by values. Transformational leaders engage their followers in organizational changes through inspiration, exemplary practice, collaboration, and trust (Basham, 2012). Also, while creating greener jobs, organizations tend to have more empathy on leadership values (Green & McCann, 2011). Empirical research called for studies, which link values to accompanied leadership behavior and how these might affect the behaviors and practices of their followers (Deichmann & Stam, 2015).

According to transformational leadership theory (B. Bass, 1985) leaders who practice green behavior at work, followers emulate such behavior since leaders serve as their role models. By sharing their environmental values, communicating the importance of environmental sustainability, and developing and applying ideas for addressing the environmental impact, leaders have a positive effect on employees' pro-environmental behaviors (Graves, Sarkis, & Zhu, 2013). Transformational leadership theory also explains the unique connection between a leader and his/her followers that accounts for extraordinary performance for the organization (Yammarino & Dubinsky, 1994). To accomplish a transformation, B. Bass (1985) defined the four leadership key dimensions of transformational leadership. *Charisma* involves gaining respect, trust, confidence of others and transmitting a sense of a shared mission to followers. *Inspiration* is communicating this mission with confidence, increasing optimism and enthusiasm. *Intellectual stimulation* is actively encouraging others to look at old methods in new ways, fostering creativity, and stressing to use own intelligence. *Individualized consideration* is giving personal attention to all individuals, making them feel valued, and recognizing everyone's

contribution. *Individualized consideration* and *intellectual stimulation* exercised by transformational leaders have been found to directly enhance employees' to engage in green behaviors (Graves et al., 2013). Also, transformational leadership has been found to be enhancing followers' effort and performance, as well as leaders' effectiveness to attain organizational goals (Bernard M Bass & Avolio, 1994). Moreover, B. M. Bass (1997) indicated that transformational leadership style, is transcending national borders. Therefore, it is assumed that this leadership style can be found in Indonesian transportation and logistics companies and possibly in other emerging economy contexts.

Henceforth, this study examines the relationship of transformational leadership and employees' lean and green practice adoption. Moreover, it aims to establish grounded theory in the field of lean and green leadership, which to be used in future studies, conducted in other business sectors and/or national contexts.

3. Methodology

3.1 Context

Indonesian transportation and logistics

The research context is the logistics and transportation sector in the emerging economy of Indonesia. The emerging economy is in need to apply lean and green practices in their logistics and transportation firms (Neo et al., 2021).

Logistics is broadly defined as the transportation, the procurement, the consolidation, the trans-shipment, the storage, and packaging of goods, as well as the facilitation of these processes in administrative means (Sangka, 2017). In recent years, the Indonesian logistics and transportation sector faced a period of strong economic growth of almost 15% per year, due to increased customer and industrial activities in Indonesia and abroad.

The overall market structure is fragmented with several large international logistics providers such as DHL or UPS and thousands of small and medium-sized enterprises, which create a tight price competition on the national market (Setiawan, 2018). In addition, there are comparably high prices for logistics services due to the geographical condition of Indonesia being a state consisting of numerous islands (Rahayu, Purnomo, & Malawani, 2020). Also, environmental problems caused by the logistics and transportation sector become a serious driver of environmental pollution in recent years (Widyaparaga et al., 2020).

3.2 Research Design

The aim of this research is to unravel the relation between Lean and Green leadership behaviors and their possible underlying values and transportation and logistics company employees' intention to adopt Lean and Green practices in the emerging economy context of Indonesia. Given the aim and scope of the research, a qualitative case study was applied. Eisenhardt and Graebner (2007) classify case studies as rich empirical descriptions of instances of a phenomenon.

The study's data consists of qualitative interview data. The data was obtained during semi-structured in-depth interviews with employees and leaders of an Indonesian transportation company.

3.3 Sampling Strategy & Sample Description

The interview data of the case stems from a larger data set of four case studies, which were obtained by convenience and snowball sampling by another researcher.

The sampling strategy for the transportation and logistics company, which served as the case in this research, was obtained by purposive sampling. This sampling strategy is designed to enhance understandings of the selected individuals and their experiences (Devers & Frankel, 2000). Schatzman and Strauss (1973) state that in purposive sampling the researcher selects the case according to the aims of the research. The logic and power of purposive sampling lies in selecting an information-rich case. Information-rich cases are those from which one can learn a great deal about the issues of central importance (Patton, 1990). For this research, the current degree of lean and green adoption was centrally important. The preferable approach was the adoption of both practices in the organization's business practices (Garza-Reyes, Villarreal, Kumar, & Molina Ruiz, 2016). The CEO classified the company as a transportation company, embedded in the logistics sector. The company employs 30-35 people in total, as well as 306 trucks for drivers, working on a contractual agreement.

Both practices were simultaneously adopted. The firm faced a strong competition in their market segment. With an implementation of lean and green, the firm was hoping to increase their market share.

3.4 Data Collection

The interviews have been conducted at the transportation company's site in Indonesia by a Indonesian native researcher. The interviews with the different employees and leaders were mostly done directly at the workplaces to avoid disruptions during the respondents' work. The data collection was executed in November and December 2019 and the interviews took 45 to 120 minutes. In total, 23 interviews have been conducted. Due to the company size, counting roughly 30 people at that time, the data collection could involve almost every employee and leader (see Table 1). The interviews have been audiotaped and were transcribed in its original Indonesian language. After that, the interviews were translated into English by a professional Indonesian to English translator.

Table 1

Interviewees' characteristics

Profession	*Gender*	*Age*
CEO	Male	42
General Manager	Male	35
HR Manager	Female	28
GPS tracking administrator	Female	22
Feasibility Manager	Male	33
Administration 1	Female	22
Administration 2	Female	20
Training facilitator 1	Male	27
Training facilitator 2	Male	27
Maintenance employee 1	Male	28
Maintenance employee 2	Male	32
Maintenance employee 3	Male	21
Warehouse employee 1	Male	27
Warehouse employee 2	Female	23
Warehouse employee 3	Male	35
Material Handling 1	Male	28
Material Handling 2	Male	20
Truck Driver 1	Male	42
Truck Driver 2	Male	65
Truck Driver 3	Male	43
Truck Driver 4	Male	45
Truck Driver 5	Male	48
Truck Driver 6	Male	53

3.5 Data Analysis

The data analysis is grounded on the approach of abductive reasoning, which aims to generate conjecturable explanations and extend theory (Bamberger, 2019). Compared to the more commonly used inductive and deductive reasoning, abductive reasoning seeks to generate plausible first suggestions about phenomena and their explanations based on empirical observations (Bamberger, 2019).

For the analysis, the software *Atlas.ti* has been used. The aim of the coding process was to build a descriptive, multi-dimensional preliminary framework (Glaser, 2016), and build a graphic grounded theory model (Gioia, Corley, & Hamilton, 2013). The analysis of the interview data roughly followed Blair (2015) three steps of open coding, namely open coding, axial coding, and selective coding. In a first *open coding* phase, codes were assigned to the data in a joint process between the Indonesian supervising researcher and me. Here, both researchers individually coded a lengthy interview verbatim of another case company. The codes were discussed and merged, this resulted in a first preliminary set of codes. After that, while *axial coding*, the originated codes were merged into broader code groups to precise and complete explanations. The third step of Blair (2015) open coding, *selective coding*, was done to approach a new concept development and facilitate a future articulation of grounded. Gioia et al. (2013) stated that when the first Order Concepts and the second order themes are done (here code groups), the basis for aggregated dimensions is given. During this research, the aggregating into overarching dimensions was done in the results section (see section 4), which facilitated the readers' processing of the results. Consequently, the applied three steps of coding, based Gioia et al. (2013) and Blair (2015) were done to build a grounded theory model.

4. Results

From the analysis of the 23 interview transcripts 146 codes emerged, which were matched into 26 distinct code groups. In Appendix 1 the entire code book is found.

The structure of the results section offers a coherent story to the reader, which aims to facilitate the processing of the results. The extensive number of code groups and codes was too large to include the entire set of codes into the results section, which is why a selection has been done. The selection is based on the following criteria: The code was applied at least 2 times and fitted into the scope of the research, primarily focused on leadership during lean and green adoption. Hence, in appendix 1 the codes which were not used are colored in red.

The selection of codes and corresponding code groups were matched into seven overarching themes, which serve as the structure for the results section (see Table 2). The structure aims to represent a chronological order of the lean and green management adoption in the case company. At first, the contextual factors for this adoption will be presented. After that, the lean and green enablers will be shown. Next, specific leadership behaviors and barriers to lean and green adoption will be pointed out. As a fifth theme, attitudes of employees toward lean and green are shown. Followed by that, the actual lean and green practice adoption by employees is presented. Last, effects of lean and green adoption are pointed out.

Table 2

Results structure based on seven overarching themes

Codes	First order: Code groups	Second order: Themes
Sustainability aspects in the Indonesian transportation sector	Green aspects in emerging economy	**1. Contextual Factors**
Requiring specific certificates for sustainability Customers require drivers to use smartphones High economic pressure due to high competition in Indonesian's transportation sector	Initial deciding factors for Lean & Green	
5S in Lean Kanban in Lean	Lean Tools	**2. Lean & Green Enablers**
Green vehicles	Technological factors towards green management	
Use of different technologies in lean management	Technological factors towards lean management	
Weekly employee meetings with leaders Green trainings for truck drivers	Lean & green Training	
Employee positively value leadership support Leader motivates employees to adopt green behaviors Increasing employees' self-confidence through leadership Leader respects employees' character while providing support Believing in employees' creativity Direct supportive behavior from leader to employee	Supportive Leadership Behavior in lean & green adoption	**3. Lean & Green Leadership Behaviors**
Leaders' behavioral changes follow regulatory framework	Leadership Behavior regarding Lean & Green adoption	

Limited technological knowledge Challenge to change truck drivers behavior to adopt Lean & Green	Human resource barriers	**4. Lean & Green Barriers**
No initial understanding of Green Employees are confused about lean & green initiatives	Unclarities about Lean & green management	
Technology flaws hinder work performance	Technology flaws	
No sufficient training on applications for truck drivers	Organizational barriers	
High cost as barrier to green management'	Financial barriers	
Many regularities for technology usage Regulatory obstacle to create a greener vehicle fleet	Political & regulatory barriers	
Changes need time Follow the leaders in adopting lean & green management	Change perception by employees	**5. Employees' Views on Lean & Green**
Lean adoption followed by Green adoption	Lean first then Green	
Employees actively participating in changes towards lean	Employees' attitude towards lean management	
Maintaining the vehicle's engine Paperless as green initiative Small notes to truck drivers as reminder to green initiative	Green practices	**6. Lean & Green Adoption**
Cleaning the vehicle Follow peers in adopting Lean	Lean practices	
Employees contributing their ideas more openly	Perceived behavioral changes by employees	
Achieving ISO 9001 Easing processes with customers Lean makes personal working experience more neatly	Positive outcomes by Lean & Green adoption	**7. Effects of Lean & Green**
Easing administrative processes	Lean as efficiency	
Safety aspects in transportation	Safety aspects in Lean & Green	

4.1 Theme 1: Contextual Factors

From the analysis, codes that display the case company's context have emerged. The examined case company finds itself in the Indonesian transportation sector. According to its CEO, the company was the first one to apply green management practices: "*(...) we are the first transportation company in Indonesia [to adopt green management] and I don't think many are concerned about the environment" (CEO).* This was also related to his thinking that the Indonesian society should take environmental pollution more seriously: "*We must stop saying pollution is not a problem; that traffic jam is not a problem" (CEO).*

The initial deciding factors of the company to adopt lean and green management were mainly economically driven, meaning that lean and green management were initially adopted to gain economic advantages for the company, e.g. increasing the company's customer portfolio. The CEO and the training department articulated that internationally operating customers required certain sustainability certificates and usage of technology, such as applications used by truck drivers: "*Indeed, not many have done this for 'Ecovadis' because the brandmark is not only in Indonesia, but throughout the world. For example, Nestlé ... So Nestle requires us to follow 'Ecovadis' in terms of sustainability" (CEO). "Technological demands must be included in the company's SOP, as well as demands from customers who require each driver to have an application/smartphone (...)" (Training employee 1).*

Also, the economic pressure among the Indonesian transportation market was very high with numerous companies operating in this business sector, as the CEO mentioned it: *"There are many companies in the transportation sector, 1,500,000 MSMEs, 800 companies at the middle level, 200 companies are big. That's roughly the landscape, according to the BBC" (CEO).* This created a fierce competition for customers between the competing transportation and logistics companies, leading to the adoption of lean and green management, to stand out in the market.

4.2 Theme 2: Lean & Green Enablers

The identified enablers were a crucial part for the adoption of lean and green management practices. The analysis identified various enablers, including foremost: lean tools, technological factors towards green and lean management and the centrally important enabler of lean and green

training. First, lean tools, which were applied by the company were mainly 5S and Kanban, as an administration employee and a training employee mentioned: "*(...) changing [smile] habits such as implementing 5S (...)" (Administration employee 1). "I use Kanban to check the progress of the drivers, and show to the results in our room to more clearly see what information is missing (...)" (Training employee 1).*

According to one truck driver, the case company renewed their trucks regularly and kept up the maintenance as an enabler for green management: "*Here, we keep changing the cars… if their ages have run out. I've been working here for three years, and I've changed trucks 4 times. Always new… keep the maintenance under control (Truck driver 1)."*

Central technologies, which enabled a lean management adoption were location tracking and loading/unloading applications, according to the General Manager. These technologies were used to implement more efficient work and a better documentation. "*We also use technology with smartphone to update their location, there is a special digital platform from us, and there is also technology from consumers [loading and unloading system]" (General Manager).*
With location tracking and loading/unloading applications, the progress of each business operation could be documented more clearly, and their administration was eased.
The most important behavioral enabler towards lean and green adoption were training sessions that the company provided to its employees. "*(...) and we have a weekly meeting that helps us to be clear about our task. We talk about our problems. So, the solutions will be easy to find and solve." (HR employee)." I think the weekly meeting is very helpful for employees in terms of giving ideas or participating in changes that are planned by the company, of course, even though sometimes the ideas are not great, but we are trying to participate in this change for the better, it is very enjoyable for me." (Warehouse department employee 1).* During the meetings with the CEO and General Manager, employees engaged in problem solving, learning from peers, and getting provided with clarifications about work tasks, as stated by the HR department employee *"Our Boss always asks what the problem is when we work or during weekly meetings. The Manager is also always present to help with our operational work and solve problems … [very confident]" (HR department employee).*

4.3 Theme 3: Lean & Green Leadership Behaviors

In the interviews, many respondents talked about the leaders' supportive behavior. This type of leadership behavior was seen by the company's employees, as well as in leaders' descriptions about their own behavior: "*(...) the important thing is how the leadership supports us (...) the*

important thing is to be guided and supported." (Truck Driver 5);" (…) but we also educate them to be more responsible and independent in solving problems and in providing ideas... otherwise, they cannot increase their self-confidence" (General Manager). Moreover, leadership support was articulated in motivation enhancement, especially in green practice adoption, seeking to increase the employees' confidence in problem solving abilities, and believing in the employees' creativity: "*(…) this is also because the leadership keeps saying, it must be like this, that way… we must be concerned about the environment." (Truck Driver 3).* This happened while respecting the employees' distinct characters, as the General Manger and the GPS department employee said: "*(…) you can see too, many of our employees are not confident in providing ideas or initiatives ... they are actually very creative, just not confident" (General Manager);" I am a passive person, so he often asks things, actively talks with me about the obstacles I faced at the meeting" (GPS department employee).*

Furthermore, the employees said that they experience direct leadership support to a great extent. *Very supportive, I used to meet or talk to him just in a meeting. Now our boss asks more and more questions directly, how is it going, what's the problem? Then you can chat directly and ask for engine repairs, for example. (Driver 2). Wow, very supportive… [seem enthusiastic], he pays attention to us. Back then it was difficult to ask for a vest, he said there was no budget. But now he asks us what do we need? (Driver 1).*

Also, the employees pointed out that they were able to talk to the leaders about problems they encounterd, whether anything was needed, and that the leaders are often directly at their employees' workplaces, as the GPS department employee and one warehouse employee stated: "*The point is, if my boss knows about the problem, I am not afraid to give my point of view to the customer in the future, because the Boss is supporting me" (GPS department employee); "They [CEO and GM] often go directly, we also often talk about problems that occur, for example, this morning P.K. came and asked how I was, then he asked about consumer problems and if there were critical things that needed to be addressed quickly (Warehouse employee 2)."*

Regarding the lean and green management adoption the CEO stated that the leaders based their behaviors on a regulatory framework for lean and green practice adoption, which the company established. "*(…) we try to make behavior modifications as much as possible, we will always do that. Of course, everything runs based on our existing regulatory framework (…)" (CEO).*

4.4 Theme 4: Lean & Green Barriers

In the data, several barriers regarding lean and green management adoption have been identified. These barriers consist of hampering employee behaviors, notions and unclarities of the employees towards lean and green practice adoption. But also, of flaws in the technology application.

An important barrier was found in limited technological knowledge of employees, especially the usage of smartphone applications by the truck drivers: "*There is no problem with changes, only with the usage of applications that drivers must learn first … and not all drivers can learn fast" (Warehouse employee 3); "It's doubling the job, right. It is the only hassle, I'm not used to using a cell phone. I used to use it just to make phone calls, now I must be able to use the applications, too" (Truck Driver 2).* Another human resource barrier was the ability to change the truck drivers' behavior to adopt lean and green practices. The GPS employee said that it is difficult to deal with the drivers in the warehouse. "*There will not be dirty stickers and there will be smoke-free office air. Especially the warehouse part, but it will be quite difficult dealing with the truck drivers there." (GPS employee)*

Moreover, one warehouse employee stated that the drivers are sometimes unwilling to adopt changes in their work procedure. "*It's challenging to involve the drivers. They are still traditional and generally don't want much change in procedures … [exhale]" (Warehouse employee 1).*

Oftentimes, unclarities about the term 'Green' were mentioned by the employees. Several employees understood green management as placing more plants in the office. *"I'm sure all my friends are still confused about how to start… with the number of plants at the office I don't think it's enough." (Administration employee), "Oh, that … yes ma'am … yesterday we tried to have plants in every office." (Administration employee 1); "I'm sure all my friends are still confused about how to start… with the number of plants at the office I don't think it's enough." (Administration employee 2)*

One administration employee said that their leaders merely ordered the adoption of green practices, without enhancing their knowledge about it, leaving the employees confused: "*(…) they will ask to be greener, whatever it is … but the problem is that we still lack knowledge. Therefore… we are still confused. The boss, only orders, comes back … we are still confused about it" (Administration employee 2).* The confusion about lean and green adoption led the employees to trust on 'learning by doing' and copying the lean and green practices from their

peers: "*(…) although sometimes we still don't know what to do? Just a few examples, sometimes I'm also confused, but just learning by doing!" (Warehouse employee 1). "I'm still confused… so I just went along with other colleagues" (Material handling employee 1).* Unreliably working technology hindered lean and green management adoption. The GPS signal in the newly adopted loading-and unloading applications on the drivers' smartphones cannot be received at any point of the tour. This hindered their work performance and led to delays in the work processes, as several drivers mentioned: "*(…) but sometimes we don't get the signal. The GPS is not accurate, we must go around and around again. Hence, it will take us a long time to enter the warehouse for loading and unloading. We'll have to exceed our target deposits" (Truck driver 2)*; "*The application uses a cellphone signal, but when our location is in the middle of an area where the signal is not yet strong, we can't report it easily… a lot of things we end up doing manually again, by contacting the vendor [customer] or the office person (…)" (Truck driver 5).* Moreover, one truck driver said that the company did not offer sufficient training for the newly adopted applications by the truck drivers, which was identified as an organizational barrier: "*(…) there are applications that also help, but we should be given training first, and we need many applications (…)" (Truck Driver 5).* Furthermore, the financial ability to obtain more sustainable fuels was identified as a financial barrier. The more sustainable fuel called *Pertadex* and is a high-cost factor, compared to the biodiesel, which was currently used by the company: "*Pertadex costs 200,000. While the bio-diesel we currently use is 5,250" (CEO).* Also, some regulatory barriers had a hampering effect on the adoption of lean and green management. In Indonesia diesel is still more easily available than gas fuel, such as LNG (Liquefied Natural Gas); "*If I'm not mistaken, the problem is that there are still limited places or locations that provide gas fuel in Indonesia, compared to diesel fuel" (Driver 2).*

4.5 Theme 5: Employees Views on Lean & Green

The employees themselves had certain perceptions about lean & green management and its adoption. One maintenance employee argued that the change would need time and knowledge about lean practices is not sufficient, yet: *"(…) so, I still try to understand more about the first initiation [lean adoption. Everyone needs time, right? Yes, ma'am, you can't do it all right away… that's all, we still have a lot to learn!" (Maintenance 2).* Many employees from all professions articulated that they simply follow the changes, without spending much time questioning the management decisions: *"I'll just go with it… there's nothing complicated either. It's still the same. Nothing has changed 100%. Let's just follow it" (Truck driver 4); "Yes, I'll*

follow what the company wants... we'll work (...)" (Warehouse department employee 1). Also, a material handling employee pointed out that the focus is on lean practices and efficiency creation rather than on the green practices, implying that lean was adopted first, then green: *"(...) still follow the efficient one first, then the pro-green one, and it seems that the focus on the mod and fuel ... for the office environment is not yet significant" (Material Handling employee 2).*

4.6 Theme 6: Lean & Green Practices Adoption

The interviews prevailed that the employees developed an awareness for lean and green practices and adopted these into their daily routine.

The most important green practice applied by the company's employees was maintaining the vehicles engine. One truck driver mentioned that keeping the truck in good condition is a crucial part, as well as reporting to the management in case something needs to be fixed. Also, the Maintenance employees adopted the same practices, to prevent the emission of black smoke: *" I just keep the engine in good condition, report the office if the engine or oil has to be replaced. I replace the oil at least after 5-time loads, so the smoke won't be black. If the engine is good, good oil will not pollute. What I am improving is to keep our trucks clean since each driver will be in charge of a truck. So, the truck is like our own house. Keep the truck clean, keep the engine in good condition. And just report to the management frequently of what is lacking, what needs to be improved" (Driver 2); "Yes, that's why I keep the engine, so it doesn't get damaged and doesn't emit black smoke. So, keep the truck healthy" (Maintenance 1).*

Another central green practice is e-filing to reduce the usage of papers: *"Also, we no longer print paper ... this is what I like the most ... because we don't have to bother saving a lot of documents and photos to save too ... now, all emails, files or pdf or photo form. Can be ... email! Done! Practically no need to print or accept paper" (Administration department employee 1).*

An important way for green practice adoption by truck drivers are reminders about green practices in form of sticky notes, which are placed in the drivers' working areas: *"I also place notes on the wall of the driver's working area as a reminder regarding environmental work" (Training department employee 1).* Next to green practices, the employees adopted lean practices. The most important one for the truck drivers was cleaning their vehicles. One argued that cleaning is mandatory since their trucks are also sort of a home to them: *"(...) cleaning is mandatory because our house is also a vehicle ... if it is not comfortable, it will become dirty (...)" (Truck driver 4).* This is checked by the training department employees, and they remind

the drivers if necessary: *"We always check and ask how they clean the trucks and maintain their cleanliness" (Training department employee 1).*

Several employees mentioned that following their co-workers is an important way for them to adopt lean practices themselves. *"And for me for the new person, I just follow my friend (...)" (Maintenance department employee 3); "(...) I'll wait for my co-workers, I'll follow them" (Warehouse department employee 3).* Reflecting their behavioral change since lean and green management was introduced, some employees said that they are more confident in sharing their ideas: *"Share my ideas, my opinion based on previous issue in our department" (Training employee 1).* Moreover, the GPS employee stated that she took the initiative and acted more pro-actively in problem solving. *"Regarding my work on GPS, I just take the initiative to report, and act immediately if there is a problem, I don't really wait for instructions from my superiors" (GPS employee).*

4.7 Theme 7: Effects of Lean & Green

Even though the company was still in an ongoing lean and green adoption process, some of the positive outcomes by lean and green were already visible to the interviewees. Eased processes with customers were a visible positive effect: And having a clear procedure on hand, arguing with the customers about the dimension of goods became obsolete, according to a truck driver: *"And now there is no need to argue with customers, why they cannot send goods in large quantities or something like that ... now just follow the procedure ... and the work will run smoothly" (Truck Driver 1).* Moreover, the personal working experience of employees was enhanced. With a tidied-up workplace, it made working cozier and neatly according to the employees: *"(...) it's easier to work because it's not stressful to see things messy again, everything is neat and organized" (Material Handling employee 1); "Working faster, and more neatly for sure" (HR employee); "I more organize, always love and cozy if everything neat around me (...)" (Maintenance employee 3).* Another effect provoked by lean and green management adoption was the enhancement of efficiency. Especially administrative processes were eased by lean adoption. With strict deadlines in place, payments were not delayed anymore, as the general manager stated: *"In the past, many payments were delayed, but nowadays there are almost no problems in the financial sector ... well ... In the initial process, we started to make deadlines for each job because basically" (General Manager).* Also with the GPS application, reports became more clearly and traceable. *"To adopt lean will certainly benefit the company, with the existence of actual reports that are clear. Companies can access real and*

clear data because of the accurate GPS. And of course, to regulate which truck priorities should take precedence for inspection or monitoring" (GPS employee).

With the adoption of lean management and in parts green management the overall safety of the company's trucks was positively influenced. The CEO has initiated that safety is prioritized. This measure was checked by the maintenance employees: *"As far as I know, P.K. [CEO] always advised to "put safety first". Units (trucks) are always controlled for road readiness" (Maintenance employee 1).*

5. Discussion

The aim of this research was to explore the relation between Lean and Green leadership styles, and transportation and logistics company employees' intention to adopt Lean and Green practices in the emerging economy context of Indonesia. Thus, to answer the central research question: *How does the leadership style of leaders relate to Indonesian transportation company employees' intention to adopt lean & green practices?*

The research found that the company's leaders initiated the adoption of lean and green management to make the company more efficient and meet the needs of internationally operating customers like *L'Oréal.* To adopt lean and green, a line of lean and green enablers were implemented into the business practices, like 5S, kaizen, technology that facilitates lean like loading-unloading smartphone applications, and technology for green management like newer and more sustainable trucks. Moreover, the analysis showed that the leaders expressed a behavior that supported the employees to adopt lean and green practices. These supportive behaviors were regular visits at their employees' site of work, believing in the employees' ability to transform their work behaviors to become lean and green oriented, support the employees in weekly meetings and whenever they would encounter problems during the lean and green practice adoption process. This supportive leadership behavior was value driven and was based on respect for the employees and the environment. However, during the analysis, also barriers to lean and green have been found. Technological knowledge of the truck drivers and unclarities of green management were human resources barriers. Oftentimes, missing knowledge about the ongoing changes within the company was visible. Many employees articulated that their views about lean and green adoption was that they did not spend much time thinking about it, they simply followed the changes the leaders demanded. However, lean and green practice adoption were visible like more organized behaviors while also demand other employees to adopt lean and

green practices (for example with help of reminders on sticky notes). Lastly, the analysis showed that the benefits from lean and green management adoption were already visible to the employees and leaders. Important benefits were administrative efficiency and a subjective feeling of an enhanced working experience. In the following, these findings are discussed more detailed with help of academic literature.

Regarding lean adoption, literature stressed the importance of lean enablers, especially behavioral and human enablers (Van Dun & Wilderom, 2012). However, the most important aspect for the employees' lean and green practice adoption was lean and green training. Netland (2016) showed that after management commitment, the most important factor for lean adoption success was lean training. Bandura and Walters (1977) social learning theory indicated that people are more strongly influenced by proximal rather than distant others. During a social learning event like the company's weekly meetings with the leaders, the employees were directly influenced by the leaders' expertise, and were creating knowledge about lean and green practices. Literature indicated that employees who experience their leaders to promote green practices and take sustainability seriously, they are more likely to adopt these practices themselves (Robertson & Barling, 2013).

The observed leadership behavior and leader-employee connections indicated strong links with the transformational leadership style. Transformational leaders seek to achieve high levels of performance through transforming followers' attitudes, beliefs, and values. B. Bass (1985) identified four leadership key dimensions, *Charisma, Inspiration, Intellectual stimulation,* and *individualized consideration*. Charisma was expressed by directly supporting at the employees' workplace, creating a connection and a shared mission for lean and green adoption. Inspiration was expressed regarding green adoption, while communicating the need for more sustainability. Intellectual stimulation was applied by motivating the employees to be more confident in problem solving. Moreover, in boosting employees' creativity as expressed by the general manager. Individualized consideration was detected in leaders' respecting the employees' individual character while supporting. With the fulfilment of the four transformational key dimensions, an important factor towards the organizational aim to adopt lean and green management has been found in transformational leadership.

Also changes in the employees' behaviors were visible. Most importantly, the employees adopted proactive behaviors. Employees contributed their ideas more openly and tended to act more confident towards problem solving. Here, one can see the effects of the strongly transformational leadership by the CEO and the general manager. Especially the key dimension

of intellectual stimulation by motivation enhancement towards problem-solving abilities is observable (B. Bass, 1985).

Moreover, during the interviews barriers to lean and green management adoption were observable. The barriers showed that there are some lean and green barriers that were located outside the company's operations like missing GPS signals or missing gas stations. However, most barriers were located within the company and were related to missing knowledge transfer about lean and green.

Based on the results and their discussion based on literature, a conceptual model of lean and green management adoption has been created (see Figure 1). The conceptual model serves as a grounded theory model that aims to show the dynamic interrelationships, explaining the investigated phenomenon of leadership during lean and green management adoption (Gioia et al., 2013).

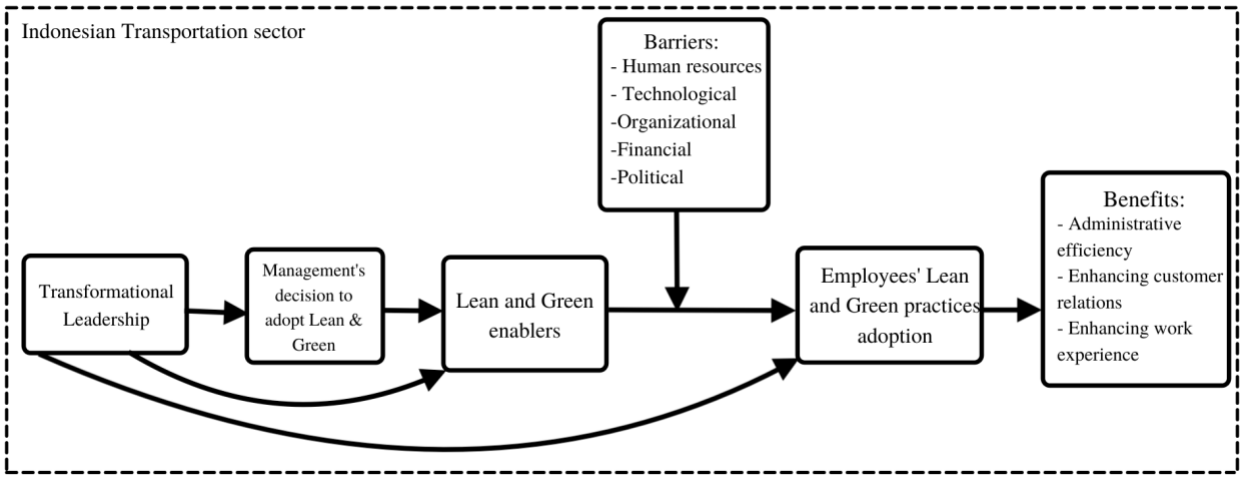

Figure 1. *Lean and green management adoption process in an Indonesian transportation company*

The process starts at the left side with transformational leadership as a starting point to the lean and green management adoption process. Charismatically, the organizational leaders initiated the change toward lean and green management adoption and created a shared mission with their employees to adopt lean and green practices. The leaders inspired their employees to follow green behaviors and helped them succeed by providing help directly at their workplaces. They applied intellectual stimulation by motivating the employees to be more confident in problem solving. Moreover, while boosting employees' creativity. Individualized consideration was

detected in leaders' respecting the employees' individual characters while supporting them. With the fulfilment of B. Bass (1985) four key dimensions, transformational leadership has been identified as a central starting point for the adoption of lean and green management. Moreover, Deichmann and Stam (2015) called for research examining leadership work values and their relation to their followers' practices. Since the transformational leadership type was clearly visible in the leaders' behavior, the possibly underlying values are discussed from a transformational leadership point of view. According to academic literature, transformational leadership is based on the aspects of motivating people by appealing to higher ideals, defining and articulating a vision for the future and expressing credibility (Tracey & Hinkin, 1998). All these aspects were present in the observed transformational leadership behavior. Moreover, Dixon (1998) defined self-confidence, inner integrity, and honesty as central values that produce transformational leadership behaviors. It was found that the expressed transformational leadership had a direct influence on the employees' intention to adopt lean and green practices. Following their leaders' transformational leadership, the employees adopted some lean and green practices. Important green practices were maintaining the vehicles engine to avoid pollution and saving printing paper by using e-mail and e-filing during administration tasks. Another practice adopted by supervising employees like the training department, were small sticky notes to remind the truck drivers about the green adoption. Also, other empirical research has shown that transformational leadership has a positive effect on employees' motivation to adopt green practices, thus its overall organizational adoption (Graves et al., 2013).

Next to the employees' lean and green practice adoption, transformational leadership style also had an influence on the overall decision to implement lean and green management in the transportation company. The CEO noticed the urge to tackle the problem of environmental pollution from the Indonesian logistics and transportation sector. But also, Also, the Indonesian government released plans to reduce the transportation's energy consumption. In 2017, the Indonesian transportation accounted for almost half of the national energy consumption. The national government urges the transportation sector to reduce its CO_2 emissions drastically in the upcoming years (Widyaparaga et al., 2020). Resulting from that, green practice adoption and more sustainable operations also became a selling point for the Indonesian transportation company. Competing for international customers like *Nestlé* on the dispersed Indonesian transportation market requires sustainability certificates like *Ecovardis*.

Both, the management's decision to initiate lean and green in the transportation company, and their transformational leadership behavior had an influence on the establishing of lean and

green enablers in the company's work processes. The most important enabler to lean and green management adoption were weekly meetings, which functioned as training sessions for lean and green practice adoption. During the meetings, the employees would receive help from the leaders in problem solving, get clarifications about certain tasks, and engage in peer-to-peer learning. Bandura and Walters (1977) social learning theory indicated that people are more strongly influenced by proximal rather than distant others. During a social learning event like the weekly meetings with their leaders, the employees created knowledge about lean and green practices. As employees experienced their leaders to promote green practices and take sustainability seriously, the employees are more likely to adopt these practices themselves (Robertson & Barling, 2013). Moreover, Bandura and Walters (1977) stated that new behavior patterns are best acquired through direct experience and by observing others. During a case study in the supply-chain sector, Campos and Vazquez-Brust (2016) found out that training on lean and green empowers the employees, reduces company risks, and grants more control and auditing to a company.

The established lean and green management adoption enablers have led towards the employees' lean and green practices adoption. However, the analysis identified central barriers that potentially hampered the lean and green practice adoption by the employees. A central barrier to lean was drivers' limited ability to work with the loading-unloading application. Moreover, employees were confused about the lean and green initiatives. Bhasin (2012) defined these barriers as 'Lack of understanding of process' and 'Lack of implementation knowledge'. Another barrier was in the truck drivers' behavior. The behavior of the truck drivers was perceived as difficult to change, according to their direct supervisors. Aziz and Hafez (2013) identified employees' resistance to lean as a classic workforce barrier. Moreover, technology flaws, especially the missing GPS signal in the loading-unloading application were reported. These flaws led to a dissatisfaction about the newly implemented lean technology and created work force resistance in form of stress and pressure in deadlines (Aziz & Hafez, 2013). Also, barriers in the adoption of green management have been found. Perron (2005) defined four barriers categories that hamper the adoption of green practices in supply chain organizations. Perception barriers, for example management resistance to change, information related barriers (lack of environmental awareness or environmental impacts), resource barriers (financial or human resource related), and technical barriers (lack of new technologies, and or technical expertise). In the data information related barriers to green adoption were found, employees expressed their confusion about green management purpose. Another central barrier were high costs for more sustainable vehicles. This barrier was classified as a financial resource barrier

according to (Perron, 2005). Also, one technological barrier to green adoption (Perron, 2005) has been found. In Indonesia, there is not enough capacity for gas fuel, compared to conventional diesel fuel.

Even though barriers have been identified, the interviewees already experienced beneficial effects that lean and green practice adoption had on their work. Processes between customers and truck drivers were facilitated. Several employees expressed that their general working experience was perceived as more neatly due to lean practice adoption and a more organized and cleaner workspace. An important benefit stated by the general manager was the easing of administrative processes and especially the more efficient receiving of outstanding payments. Also, in academic research, the positive effect of lean management on financial efficiency has been stressed (Bhasin, 2012). This shows that even in the adoption process of lean, direct benefits on financial performance have been attained.

6. Practical implications

Based on the study's findings and established conceptual model, the research contributes implications, which practitioners, for example change consultants or organizational leaders, can implement into organizational practice.

The study showed the importance of the type of transformational leadership while implementing organizational changes like lean and green management adoption. Thereby, the importance of values, which strongly influence this type of leadership should be considered. While recruiting transformational leaders, potential leaders should be assessed based on a basic set of transformational values such as self-confidence, inner integrity, and honesty. Moreover, on their ability to create shared vision or an organizational goal and motivate their followers to achieve this vision. Also, any conflicting notions with cultural norms in the company or the countries of operation should be carefully assessed while establishing transformational leadership in a change process.

While adopting lean and green management the decision-makers should always know the reason why they originally started to adopt these management practices. Potential benefits, which could serve as a motivation should be identified. Based on that, a basic pathway of the lean and green adoption should be established and regularly evaluated with responsible transformational leaders. Also, the set of lean and green enablers should be carefully identified and evaluated. Moreover, the results showed the importance of target-oriented lean and green training and

knowledge diffusion processes, which the company should establish prior to the actual lean and green management implementation.

Also, the set of lean and green enablers should be chosen based on the company's financial abilities and e adjusted to the economic ecosystem the company is operating in.

The barriers to lean and green adoption should be identified, for example during regular employee polls or interviews. Identified barriers should be categorized, as done in the conceptual model, serving as a starting point to react to potential barriers in the process. Also, based on identified barriers, the basic pathway to lean and green adoption could be subject to adjustment by a company's decision-makers.

7. Conclusion

As in every empirical research, limitations have been identified for this study. The intercoder agreement had its limitations, here the discussions between the researchers should be extended by an intercoder agreement method, like Cohen's Kappa (Cohen, 1960)

Also, since the interviews were done in Indonesia by another researcher, and me the author of this thesis is from Germany, potential misunderstandings of cultural concepts or errors in the translation to English should be considered. Also, In the examined Indonesian company, lean and green management have been adopted at the same time. However, the focus seemed to be on the lean management adoption. There was a disparity between lean and green management adoption. Moreover, only two leaders could be identified, which seemed to be the decision-makers. A study in a bigger case company with more visible hierarchies in the management and leadership structure would provide a more generalizable results of leadership during lean and green adoption.

Future research should test the assumption, in which transformational leadership is the centrally important starting point for lean and green management. Especially during complex change processes like lean and green management implementation, the company's motivation and it effect on the lean and green adoption process are subject for future research.

Furthermore, transformational leadership should be studied into more detail. Being based on transformational values, the study of these values should be deepend and extended to study values, which are present in national cultures, and values that lean and green practicing employees hold. Hence, future research should find a way to incorporate and ask interviewees

for their work values more explicitly. Furthermore, the transformational leadership and its effect during lean and green adoption should be extended to other national contexts

Also, the lean and green synergy view, widely considered in this research should be further explored and tested, and if necessary lean adoption and green adoption should be examined separately. A separate examination of either lean or green adoption could allow for a closer examination of each concept. Moreover, also the employees' influence on the leaders should be examined into more detail. Also, training methods and knowledge diffusion should be studied in more depth to possibly enrich the results of further studies.

Concludingly, the study strengthens the view that in change processes and management adoption processes, people-oriented strategies must be considered as crucially important and that companies are sites of frequent social learning. The study identified the type of transformational leadership as the present type of leadership. The results indicated that transformational leadership behavior and its underlying values had a positive effect on employees' lean and green practice adoption. Additionally, the study implied that transformational leadership behavior had a positive effect on employees' knowledge-sharing and proactive behaviors while lean and green practice adoption. Moreover, leadership behaviors and its relationships to employees lean and green practice adoption should be studied while respecting regionally rooted notions of leadership-follower relations. The study also found that the leaders had the initial intention to implement lean and green management in the examined company and had an influence on the lean and green enablers, like employee training and clarifications about lean and green practices. Furthermore, the importance of knowledge diffusion and target-oriented training is emphasized to avoid shortcomings in the lean and green adoption process. The study results imply that lean and green management adoption has positive effects on the overall business performance of an Indonesian transportation company.

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Appendices

Appendix 1:

Codebook (ATLAS.ti Report)

- Change perception by employees
  - Change was perceived as easy
  - Changes need time
  - Employee is not experiencing start of green adoption
  - Follow the Leaders in adopting Lean & Green

- Company context (*applied in section 3.3*)
  - company size
  - Family Business transportation company
  - Status as highly professional company is the mission and vision
  - Traditional (Indo-Chinese) believe that family business will go bankrupt in third generation

Employee attitude towards Green Management
  - employee as green adoption driver
  - employee trying to adopt paperless work behavior
  - Employees do not comply to green issues
  - training employee actively participates to Green Management

- Employee attitude towards Lean Management
  - Adopting working habits in personal life (making several to-do-lists)
  - drivers require time to learn about the technology and app usage
  - employee excited to learn
  - employees actively participating in changes towards lean
  - Maintenance has more technical knowledge than leaders

- Financial barriers
  - High cost as barrier to green management
  - Missing subsidies for solar hinder the greening of transportation

- Firm-internal Communication
  - Easier communication within the firm due to Lean & Green
  - employees should ask questions
  - Management communications can be challeging in familiy-owned business
  - Technican is irritated about need to constantly remind drivers about road safety

- Green Aspects in emerging economy
  - Sustainability aspects in the Indonesian transportation sector
  - Without awareness about the bad effects of combustion engines change towards more sustainability is hindered

- Green practices
  - applying fuel efficiency as green initiative
  - Exchange about green aspects among employees
  - Fee for copying to become more paperless
  - Follow peers in adopting Lean
  - Green behavior is adopted by peers outside the organization
  - Green initiative: Work equipment must be turned off during break time
  - learning from peers about Green Management
  - Maintaining the vehicle's engine
  - paperless as green initiative
  - Respecting the speed limit as behavioral green initiave by truck drivers
  - Small notes to truck drivers as reminder to green initiative
  - Wearing uniforms makes employees embarrassed to litter

- Human resource barriers
  - training employee perceived difficulty in making people understand changes
  - awareness of employees about green aspects could be better

- challenge to change truck drivers behavior to adopt Lean & Green
- Criticism about "Free-floating" of employees as long as they archieve their goals
- drivers criticize the usage of too many applications
- Limited technological knowledge
- Refusing to adapt to technology to ease the work
- training employee perceived difficulty in making people understand changes

- Initial deciding factors of company for Lean & Green Management
  - customers require drivers to use smartphones
  - Enlarge the need to be more sustainable in the Indonesian transportation sector
  - High economic pressure due to high competition in Indonesians transportation sector
  - Lean as decision by top-management
  - Requiring specific certificates for sustainability

- Leadership Behavior regarding Lean & Green adoption
  - CEO satisfied with the development of drivers' efficiency
  - Employee does not really see changes from lean and green initiatives in own behavior, but in the leader’s behavior
  - leaders are concerned with truck condition
  - Leaders' behavioral changes follow regulatory framework
  - Motivating employees to become Lean & Green

- Lean & Green Training
  - Green trainings for truck drivers
  - testing for drivers' physiological abilities
  - Training as mean to reach Lean and Green
  - training as precautionary actions
  - training closely works with drivers to help them understand the company's vision & mission
  - training is one person department
  - training wishes for more punishment when not fulfilling lean and green adoption

- Weekly employee meetings with leaders

- Lean first then Green
  - Green Management as bonus to Lean Management
  - Lean adoption followed by Green adoption

- Lean as efficiency
  - Continous measuring of drivers' efficiency
  - defensive driving as economically efficient
  - Easing administrative processes
  - Easy process application through lean
  - Leaders concentrate on efficiency
  - Lean on organization as efficiency
  - rewarding drivers to work more efficient

- Lean practices
  - Cleaning the vehicle
  - driver to driver reminder of new working habits
  - Employees tiding up own workplace
  - Follow peers in adopting Lean
  - GPS to employees: Reminder about new working habits
  - Leader to employees reminder about new working habits
  - Maintenance to drivers: Constant reminder about new working habits
  - Maintenance is more scheduled
  - Multitasking as a new skill
  - Notes regarding change in the drivers' waiting area
  - Training department to employee: reminder about new working habits

- Lean Tools
  - 5S in Lean
  - Kanban in Lean

- More driver monitoring

- Organizational barriers
  - difficulty to shift warehouse towards Green Management
  - Fuel consumption as company's biggest source of carbon emission
  - Limited in green adoption initiative
  - No sufficent training on applications for truck drivers

- Perceived behavioral changes by employees
  - Able to express problems to leaders
  - Acting proactive towards problems
  - Bottom-up communication as pro-environmental behavior
  - employee personally challenged by Lean & Green
  - Employee seeing the positive aspects of green adoption
  - Employees contributing their ideas openly
  - Employees' resistance against changes (due to lean & green) diminished over time
  - Easier communication within the firm due to Lean & Green
  - Positive response to lean working habits
  - positive response to technology adoption
  - Taxation plans of newer and environmentally friendly technology must be changed

- Political & regulatory barriers
  - Many regularities for technology usage
  - Political issues as a barrier during lean adoption
  - Regulatory obstacle to create a greener vehicle fleet

- Positive outcomes by Lean & Green adoption
  - Achieving ISO 9001
  - Better scheduling of drivers
  - Company's benefit of lean adoption

- Easing processes with customers
- fuel efficiency as green initiative and economically rewarding
- improved cooperation among the employees
- improved firm structure due to Lean
- Lean makes personal working experience more neatly
- Relocation of employees as initiative to increase employees' performance

- Safety aspects in Lean & Green
  - in-depth investigation by the training department after truck accidents
  - increased safety due to more defensive driving
  - punishment after not following safety measures
  - safety aspects in transportation
  - training for work safety
  - Truck Technicans remind truck drivers about road safety

- Supportive Leadership Behavior in Lean & Green adoption
  - Avoiding pressure for employees due to changes
  - Believing in employees creativity
  - Confident about lean adoption process
  - Direct supportive behavior from leader to employee
  - employee positively value leadership support
  - Glorify the drivers' work to change their attitudes
  - high information provision by leaders
  - Increasing employees' self-confidence through leadership
  - Leader motivates employees to adopt green behaviors
  - Leader respects employees character while providing support
  - Manager's seeks own personal professional improvement in logistics
  - Pro-active leadership behavior in problem solving
  - Reward system during lean adoption
  - Trusting the interviewer to give the company valuable insights about lean and green adoption

- Technological factors towards Green Management
  - Bigger vehicle load with smaller carbon footprint as green initiative
  - emission reduction fleet management as green initiative
  - green adoption with help of technologies
  - Green vehicles
  - Solar panels on the office as green initiative

- Technological factors towards Lean Management
  - GPS as technology in Lean Management
  - seeking to syncronize technological loading/unloading system with the customers
  - Use of different technologies in Lean Management

- Technology flaws
  - increased workload due to technology usage in Lean Management
  - Properly working technology would ease the work processes
  - Technology flaws hinder work performance

- Unclarities about Lean & Green
  - employees are confused about lean & green initiatives
  - No initial understanding of Green