

# **Building on the shoulders of giants: Can peer universities lead the way for UT Purchasing?**

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## **ABSTRACT**

In recent years private organizations seems to recognize the purchasing not only as a supportive business department but as a source of strategic advantage for the company. While there is much literature available of how this effects purchasing departments in private companies little is known about the effects for public and semi-public organizations. This paper analyses which activities conducted by a purchasing department towards a technical university are value adding through the case of the UT purchasing department. From literature 14 different value-adding activities were defined that were evaluated through semi-structured interviews with different actors of the purchasing process showing three key areas of improvement: Early Involvement & Customer Satisfaction, Standardization & Supplier Maintenance and Forecasting Management Competences. Semi-structured interviews with top peer universities from different countries and extensive research of their websites showed that the UT purchasing department could improve their process by among others targeting professors who are early in their UT career for early involvement, creating awareness by starting a quarterly newsletter and acquiring an e-procurement system which is in different department, is very usable and has a good aesthetic.

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## **Keywords**

Purchasing department, performance improvement, value-adding activities, best practices, early involvement, innovation.

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## 1. INTRODUCTION

Purchasing departments have been around for decades, but only in recent years private organizations have realized that these departments are not only useful in supporting the other departments in conducting their business, but can also generate cost savings and provide a strategic advantage for the business. For instance, “The strategic importance of purchasing has been accentuated by the decreased prominence of manufacturing and the outsourcing of what could otherwise be considered a key source of competitive advantage” (Sheth, Sharma, & Iyer, 2009). This puts a large responsibility on the purchasing department to establish a good relation with the suppliers in order to gain and sustain this competitive advantage. Also, “purchasing volume expressed as a percentage of a firm’s total turnover has risen substantially” (Schiele, 2007). This makes it important to look at a purchasing department for cost savings, since changes in this department will have a large effect on cost savings.

While there is much literature about how the purchasing department is able to add value in private organizations, less is written about the value a purchasing department can add in public and semi-public organizations in this aspect. Therefore this paper will describe the challenges that this type of organizations face through a real life case: The University of Twente (UT) Purchasing Department. This is the organization that manages the purchases that need to be done to facilitate the 9,645 enrolled students that the university currently has as well as the 1500 researchers spread out over 5 different faculties (<https://www.utwente.nl/en/facts-and-figures>, 2015). This results in the management of a total purchasing volume of around 78 million. This is conducted among others through the establishment of tenders between suppliers for big university-wide services (e.g. catering or cleaning) and processing and providing information for the purchasing requests of the different chairs that accommodate the research of the university.

The UT Purchasing Department would like to add the full value that can be offered by a purchasing department at a technical University. Therefore a thorough analysis is required in regards to the positioning, which is defined as the type of relationships that a purchasing department holds with other actors in the supply chain specific for a technical university.

## 2. THE ORGANISATION OF THE UT PURCHASING DEPARTMENT

In this section the external and internal organization of the UT Purchasing Department will be explained as well as which processes are currently conducted by which stakeholder.

The UT Purchasing Department is part of the Facility Management Department and is officially responsible for purchasing and monitoring all goods necessary at the UT.

Internally the Department is divided in three groups: the Tactical Group, which is responsible for all the processing of the tendering and are the contact persons to the clients to answer their questions and be a partner in their projects. Also the Tactical Group is responsible for the relationship with the suppliers, collecting feedback from the suppliers and upholding compliance to the tenders and the sustainability strategy of the UT. Also the Tactical Group takes on an advisory role within the purchasing process assisting all actors with questions about the UT regulations and procedures to make sure that acquisitions are running as smooth and fast as possible. Lastly each member of the Tactical Group staff is responsible for departments within the UT and the members are responsible for the contracts currently conducted for those departments to ensure the clients’ needs are

constantly recognized so that the Purchasing Department can optimally conduct their client-centered purchasing approach.

The Operational Group is responsible for the processing of orders from the University. Operational collects the purchase requests handed in by the clients and then processes these orders in the Oracle system, which is visible for the budget holder, who is to approve the order. Oracle contains information about when the order arrives, how it should be distributed (for instance chemicals require some safety regulation) and to which office building it should be delivered. When the order arrives, the Operational Department sends a confirmation to the client and the order is directed to the Central Reception Location (Garage Building), where Logistics transports it to the client. Lastly, the Operational Department sends the invoice to the Financial Department, who oversees the payment. When the supplier does not comply with a delivery time the Operational staff reports this to the Tactical division, who then contacts the supplier to fix the problem.

Lastly, the Information Management Group is responsible for the collection and analyzes of the data received from Oracle. Based on this the Information Management Group measures the supplier compliance with the delivery, the compliance of the different clients with the tenders held by the university and the compliance with the rules and procedures. The Information Management Group are also responsible for the management of the purchasing site and contract checking, to provide a last check and to ensure the orders are according to UT policy.

The Purchasing Departments strategy is to enhance the client satisfaction, but its client pool is quite complex. On the one hand the Purchasing Department supports the procurement of products by all faculties, but the clients are not required to involve the Purchasing Department in the purchasing process, which means that if the clients does not want the Purchasing Department to participate, it will be incredibly hard for the Purchasing Department to add any kind of value. It is also interesting to note that the account managers of the Facility Department are responsible for a large portion of the acquisitions like cleaning or waste pickup that are being handled by the Purchasing Department, which makes the Facility Department both supervisor of the Purchasing Department and client of the Purchasing Department. This could cause problems in terms of client independence but might also create benefits in terms of clearer communications and lower cultural distance. Also there is no clear image on which activities are really value-adding to the technical research, where the University of Twente gains its prestige from and which activities are more facilitatory, which are the activities that are a necessity but do not provide value towards the image of the UT.

## 3. RESEARCH GOALS

The previous paragraph highlights the fact that the Purchasing Department believes in customer support as a way to create value for the University of Twente, but the department is also curious whether there are more activities that can increase the value of the Purchasing Department towards the university. So the desired state that the Purchasing wants to find themselves in, is one where their value towards the university is optimized and therefore there must be an analysis of which activities can add value towards the university first.

Secondly, it is important to get a sense of where the Purchasing Department currently stands regarding these value-adding activities so there is more insight in which activities are a priority to improve and which activities are already conducted on a desired level. This will create more awareness for the Purchasing

Department on where The Purchasing Department's strengths lie so the Purchasing Department can advocate this towards their clients, which will increase their ability to show their value towards their clients and create more encouragement towards the clients to use the Purchasing Departments services.

Thirdly, it is important to create an understanding of how to improve the activities that are not conducted towards their full potential and because of this, it is important to analyze how these activities should be conducted to reach their full potential in order to bridge the gap between the current state of the Purchasing Department and the desired state described earlier. This can be used to create an improvement plan for the Purchasing Department and help them reach their full potential.

While answering this question it is important to address the implementation plan, since the department has to deal with a lot of rules and regulations for the purchasing process as well as making sure that this improvement plans will not inhibit the ability of the Purchasing Department to service their clients while transitioning.

Using this goals the following research question can be defined:

*How can the UT Purchasing Department optimize their value creation towards the University of Twente?*

To be able to answer this question sufficiently the following sub-question are defined:

a) *Which activities conducted by a purchasing department are found to be value adding towards an organization?*

b) *Which of those value-adding activities are currently conducted by the UT Purchasing Department?*

c) *How can the value-adding activities that are currently not optimally conducted by the UT Purchasing Department be improved towards a desirable level?*

The remainder of this thesis is structured as the following: First the methodology of the data collection required to answer the research questions must be displayed. Next, the results of these four data collection methods namely, a literature review of activities that are value-adding towards an organization, interviews with the actors within the purchasing process, extensive website review of different high-ranking universities and interviews with these universities on how they conduct these value-adding activities will be explained. The results will be combined into a recommendation of improvement towards the UT Purchasing Department. Lastly, the thesis will be concluded with an overview of the research activities conducted.

## 4. METHODOLOGY

### 4.1 Structure of the research

This research aims at both creating value towards the UT Purchasing Department as well as adding to the scientific literature on this topic. To do this the thesis will find examples of value-adding activities of purchasing departments in literature. This will mostly come from purchasing departments of private organizations since, as mentioned in the introduction, there is little to no research to be found about this in the context of public and semi-public organizations.

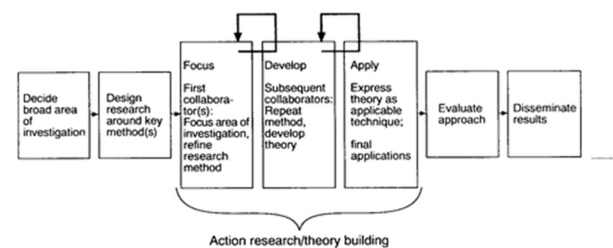
To try and add relevance towards this activities in context of the UT Purchasing Department, other universities will be interviewed to check and if needed modify these activities to make them more applicable towards the context of public universities. This approach is better known as action research. "action research can be characterized as a specific form of case study with the dual objective to contribute to the practical concerns of an organization while simultaneously

accommodating the goals of science" (Eltantawy, Paulraj, Guinipero, Naslund, & Thute, 2014).

There are three different approaches towards action research namely: technical action research, practical action research and emancipating action research. For this thesis the approach of emancipating action research will be used, which "aims not only at technical and practical improvement and the participant's better understanding, along with transformation and change within the existing boundaries and conditions, but also at changing the system itself or those conditions that impede desired improvement in the organization" (Denscombe, 2007, p. 78). This approach is chosen since this research not only aims at creating a better understanding of what value-adding activities mean and how the Purchasing Department can improve their operations, but also at making these improvements fully integral into the processes of the Purchasing Department.

There is also a disadvantage for using action research in terms of reflexivity, which means that while having insider knowledge could be an advantage to providing more relevant research, it might also cause the researcher to miss important factors, because it seems too obvious to him while an outsider would be better placed to see this kind of factors. (Denscombe, 2007, p. 80). This will be partially negated by the outsider supervision that is available during the creation of the thesis.

The model that is used for this research is visible in figure 1 (Westbrook, 1994). The figure shows 7 stages but only the first 4 will be conducted due to time constraints. The broad area of investigation has already been discussed in earlier sections and will entail the value-adding activities that the UT Purchasing Department could perform. The research is designed around the interviews with the actors of the purchasing process, the interviews with top-universities and the literature review. The literature review combined with the interviews will allow the research to focus on a set of key value-adding activities that the Purchasing Department should focus on to improve their process. Then the thesis will provide the Purchasing Department with a set of 'best practices' gained from the interviews with other universities in order to develop an improvement plan as well discussing on the integration in the purchasing procedure.



**Figure 1: Evolved Model of action research in operations management.**

### 4.2 Literature research

Literature review has as goal to determine sound and highly academic backing for the list of value-adding activities that will be created in order to be able to determine the development state of several universities during the interviews. In literature review "the major contributions are likely to be in the leading journals" (Webster & Watson, 2002). Therefore first a list will be produced from the leading journals in the field of Purchasing and Supply Management (Scimago Journal and Country Rank). From this journals, a search for articles will be conducted based on the following search words: value-adding activities, firm performance, purchasing department position and customer relations. This method does not only ensure that our findings are

within the core of the field research, but also that the articles are from a high scientific standard due to the tight regulations needed to submit an article for such a journal. What is also important is the recentness of the articles that are selected to ensure the relevancy of the articles. The time it takes for an article to become less relevant depends widely on the field and the field of Purchasing and Supply Management is not mentioned in the articles that discuss this topic. Due to a lack of knowledge around this subject the author decides to look at a time span of 10 years to ensure the availability of data required to support the research. Should there still be a lack of data, then there is always an option to expand the research criteria.

### 4.3 Interviews

The data collection regarding interviews is separated between two parts: the internal interviews with all actors related to the UT Purchasing Department, which has as goal to determine whether the value-adding activities found in the literature review are performed within their purchasing process and the external interviews with other top universities from different countries, which has as goal to create an understanding about which value-adding activities the universities perform well and find best practices to integrate within the purchasing process of the UT Purchasing Department. These universities have been selected based on the World University Rankings 2016-2017 (Times Higher Education, 2017), which ranks universities based on their teaching, research, citation, industrial income and international outlook. In this article the author made the decision to use semi-structured interviews, which is defined "as an interview with the purpose of obtaining description of the life world of the interviewee in order to interpret the meaning of the described phenomena" (Kvale & Brinkmann, 2008, p. 3). This is used, because semi-structured interviews are able to combine the advantage from structured interviews, since it allows the researcher to narrow down certain areas and topics which the researcher wants to discuss and the advantages of unstructured research, since it allows the subjects to share their stories and experiences about a certain topic (Rabionet, 2011). This will allow the interviewer to first set up general questions to see which activities the purchasing directors will come up with and thus which activities are a priority for the purchasing directors and at the same time ask follow-up questions to get an insight in their policy of the value-adding activities mentioned in this report or asking about more practical examples to find best practices required for an action plan for the UT Purchasing Department. A potential danger that semi-structured interviews can bring is that "often, it is the case that the stories people tell are ambiguous and full of gaps" (Frosh, 2007). This is hard to negate but the follow-up questions within the interview will allow the interviewee to explain him/herself when the researcher feels that there is ambiguity or gaps in his story.

### 4.4 Website search

To provide another data collection method and add to the relevance of the follow-up questions website search will be conducted. This data collection method has as goal to find success stories of the procurement departments of this universities, which would be for example major research purchases that added great prestige towards the university so the process leading up to these success stories can be analyzed during the interviews. The search terms used for this investigation are: major research projects, success stories and universities leading contributions. The search area of this search are the university sites of all universities that are being interviewed.

## 5. LITERATURE REVIEW

In this section, the results of the literature review will be outlined, resulting in a list of value-adding activities to use for evaluating the UT Purchasing Department and the purchasing departments of the other universities. In the previous section was mentioned that the articles for this section will come from the leading journals in the field of Purchasing and Supply Management. There were three journals in the top 100 journals (Scimago, Journal and Country Rank) which were: Journal of Supply Chain Management, Supply Chain Management and the Journal of Purchasing and Supply Management. During the review, the author has selected articles based on their link with performance indicators like cost reduction, strategic purchasing (Schiele, 2007) and providing a competitive advantage through suppliers (Sheth, Sharma, & Iyer, 2009). These articles all specifically target purchasing department activities or purchasing department managers for their data collection which makes it relevant for our research. Note that these articles are all in the setting of private organization, due to the little research available on semi-public organization like universities, but relevance towards technical universities will be added by testing the value-adding activities in the interviews with top peer universities.

### 5.1 Environmental and sustainability issues

"Engagement in corporate environmentalism has become increasingly important across all tiers of the supply chain" (Schmidt & Foerstl, 2017), which makes it important to clearly assess whether these activities have a real effect on the performance of an organization. Schmidt and Foerstl investigated an effective sample of 693 randomly selected companies in "German-speaking Europe" (defined as the countries Germany, Austria and Switzerland) through surveys about their relation with firm performance and Green Purchasing, which they defined as "Green purchasing practices implemented to reduce environmental impact". The research found a positive correlation with a  $\beta$  0.572 and a significance level of  $p=0.01$  between GSCM (Green Supply Chain Management) practices, which includes Green Purchasing and firm performance. The report also showed a specification of the Green Purchasing activities as "setting environmental goals and strategies together with our internal and external constituents" and "Cooperation with your suppliers for eco-design" (Schmidt & Foerstl, 2017). This article is very relatable in the context that the companies investigated are in Europe meaning that culture differences within the comparison have much less impact, than if companies from another continent would be the subject of investigation. The wording of the two activities found will be altered to fit the context of our research resulting in the following value-adding activities:

1. Setting and supporting the environmental goals and strategies of their corresponding university.
2. Cooperating with the suppliers of the university for eco-design.  
Another environmental activity can be found in the research of Young (Young, 2007). This research study analyzed the residual depositions through extensive analysis of this processes in four companies from different working branches (Furniture, Electronic Components, Industrial Printing). In this research was found that well practiced residual management can save cost and help the companies become more economically friendly. This also suggests that the activities like recycling should be handled within the process of the UT Purchasing Department and generate the following value-adding activity:
3. Finding recycle opportunities to generate more product value.

## 5.2 Standardization and Supplier Maintenance

Regarding the structuring of policies and procedures, a research that surveyed 920 randomly selected procurement managers of the Institute for Supply Management, measured the effect of standardization of purchasing procedures on the economic performance of their procurement department and found a strong positive relationship (Brewer & Arnette, 2017). Also a moderate positive relationship between good supplier base maintenance and economic performance was found. In the context of this research that means creating lasting and strong supplier relations with key suppliers. This results in the following value-adding activities:

4. Standardizing purchasing policies.
5. Creating and sustaining strong supplier relations with key suppliers.

Other literature suggested that knowledge transfer towards suppliers will improve the supplier performance and in turn help the performance of the department. This research surveyed the 56 largest Korean firms and their suppliers resulting in a total of 629 firms surveyed. This does not add to the relevance of the study but the author feels that the detailed and structured way in which the relationship for supplier development and firm performance is described qualifies this research to be used. The article describes the relationship based on the MOA framework, which is displayed in figure 2 and this shows the various features of the suppliers that enhance this process. This results in the following value-adding activity:

6. Creating supplier development projects for underperforming suppliers.

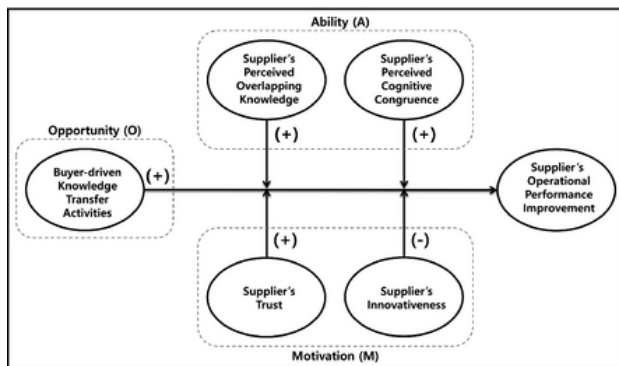


Figure 2 Research Model: A Motivation–Opportunity–Ability Perspective.

## 5.3 Innovation

To be able to analyze where the UT Purchasing Department can add value in the innovation process, first there is a need to define how this process is constructed. Figure 3 is a model that shows different sources where innovation can be created by using the data gathered from 207 Australian manufacturing firms surveyed (Oke, Prajogo, & Jayaram, 2013). As can be seen from figure 3 the main inputs are the strategic relationships and the innovation climate.

### 5.3.1 Strategic relationship

The assumption that strategic relationships are important for the performance of a company is based on the Resource Dependency Theory, “which views organizations as coalitions in which structures and patterns of behavior are molded to acquire needed external resources” (Pfeffer & Salancik, 2003). Based on this theory it can be argued that purchasing departments should try to

innovate in order to make their costumers dependent on their services due to the constant value that is offered. However it is really difficult to innovate in products like research equipment so it is a better option to create strategic relationships with suppliers in order to gain the innovation through the suppliers. This results in the following value-adding activity:

7. Creating strategic relationships with suppliers in order to sustain innovation.

### 5.3.2 Innovation Climate

To be able to optimize the gains from the innovation from this strategic partners it will be important to create an environment where innovation is not only supported but also that complementary skills are developed to integrate the suppliers in this process (Pfeffer & Salancik, 2003). This argument is not only true for the suppliers, but also the customers can assist in creating a goal list for innovation and providing the feedback for the Purchasing Department on the progress of different innovation projects. This all can create an environment that will enhance the performance of innovation and through this the organization. This is described in the following value-adding activity:

8. Creating an innovation climate that enhances innovation and integrates suppliers and customers in the process.

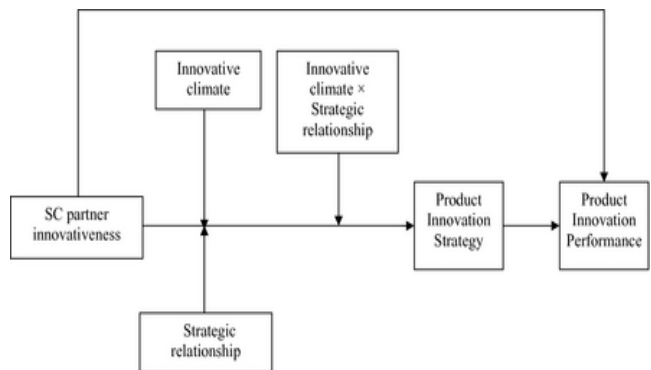


Figure 3 Research Model: Innovation Process.

## 5.4 Early involvement and customer satisfaction

### 5.4.1 Early Involvement

Early involvement is one of the big discussions between the purchasing departments and project management. Purchasing departments usually argue that it provides cost savings due to better supplier selection and integration of purchasing rules and procedures. On the other side of the spectrum the project managers claim that it raises cost due to the added complexity and longer decision making process. The following research compared 6 company case studies through semi-structured interviews with 23 purchasing managers to find that involvement into all stages of the strategic purchasing process increases the level of a purchasing department’s internal legitimacy level and development level (Tchokogué, Paché, Nollet, & Stoleru, 2017).

Putting this research into context provides the following value-adding practices:

9. Generating early involvement in purchasing projects in partnership with the chairs of the university.
10. Reducing complexity of involvement to reduce resistance against involvement.

### 5.4.2 Customer Satisfaction

The following study investigated the relationship between customer satisfaction and cost savings. This research performed

the analysis through a case study involving a leading company of the Dutch financial services industry and a finalized sample of 788 of their sourcing projects as well as an interview with their Chief Purchasing Officer. The study found a positive relationship between customer satisfaction and cost savings. Customer satisfaction is often seen as a quite vague concept which is hard to measure and therefore this thesis will stick to the definition given by this research which “reflects the extent to which the internal customer is satisfied with purchasing’s entrepreneurial ability as executed during the sourcing process” (Van Poucke, Matthyssens, & Weeren, 2016). It is important to recognize that this definition specifically says that this definition does not measure the customer satisfaction with the regulatory purchasing practices, but specifically with their ability to help find opportunities towards the improvement of the internal client’s goals. It is important that it is not only about generating value, but also making sure that the internal customer is aware of the participation of the Purchasing Department in creating this value. This will result in gaining more trust from the clients which will help in convincing the clients to follow the Purchasing Departments advice. It is also important to mention that it takes a long time to build trust, but that flaws could easily hurt this trust and therefore it is important that flaws in the purchasing process will be resolved before the flaws affect the clients. This information resulted in the following value-adding activities:

11. Generating customer satisfaction through finding opportunities to help the customer reach their goals.
12. Creating awareness of the value that the Purchasing Department is generating in order to gain trust from the customer.

### 5.5 Forecasting Management Competences

“ It is widely known that demand forecasting drives strategic and operational decisions such as identification of market opportunities, planning of financial requirements, production and capacity planning and inventory management” (Doering & Suresh, 2016). Forecasting has been connected with performance but this research takes a different approach since this study not only contains an analyses of the relationship between Forecasting Management Competences (FMC), but also conceptualizes this by 4 underlying sets of activities, namely: internal integration, forecasting process quality, effective use of advanced systems, and evaluation of forecasting (Doering & Suresh, 2016). The data for this relationship analysis was acquired through a survey approach containing a seven-point Likert scale, which was send out to senior managers who are directly involved in the forecasting process. The research showed a direct positive relationship between FMC and cost reduction as well as delivery performance. Also important to note is the fact that while FMC improves the forecasting accuracy, it is not necessarily critical that the forecasting accuracy is of a high level for the FMC practices to reap results in terms of cost reduction as well as delivery performance. Putting this research into context provides the following value-adding practice namely:

Methods	II	IV
	I	III
Management	Intra-organizational integration, communication, collaboration, coordination, internal information flow, employee accountability, broad-based (team-based) approach and accountability	Inter-organizational integration, collaboration, coordination, alignment, and forecast information sharing, directly or via CPFR, VMI, extranet connectivity, etc. and other supply chain initiatives
Individual Organization	Proper use of qualitative and quantitative forecasting methods developed	Models for assessing impact of information flow on supply chain (multi-echelon) inventories, operations, transportation costs, bullwhip effects, etc.
	Individual Organization	Supply Chain

Note: Adapted from Smith (2001).

Figure 4: Forecasting methods and management (Smith, 2001).

13. Instituting and performing Forecasting Management Practices in order to gain cost reduction and a better delivery performance.

The research also showed that the level of forecasting process quality has a larger positive relation with FMC than any of the other underlying set of activities. Figure 4 shows the different methods and management activities that can be performed. These objectives might be vastly different in a university context, but it is important to note that activities can be both performed in an internal setting within the organization or in collaboration with the supply chain. When a purchasing department will therefore try to optimize the purchasing department’s value towards an organization, the process needs to be able to stay relevant in both an internal and external setting to provide good quality. In light of this information it seems appropriate to add the following activity towards the list of value-adding activities:

14. Designing the forecasting processes to be adaptable towards both an internal and external setting to optimize quality.

### 5.6 Redesigning the framework

To conclude this literature review, this thesis discussed several articles which used different data collection methods in order to identify relationships between various activities and purchasing department performance indicators and this thesis took these activities to create the following list of value-adding activities, which can be used to evaluate universities on whether these activities are used in the purchasing process:

Value-adding activities for a purchasing department
1. Setting and supporting the environmental goals and strategies of their corresponding university.
2. Cooperating with the suppliers of the university for eco-design.
3. Finding recycle opportunities to generate more product value.
4. Standardizing purchasing policies.
5. Creating and sustaining strong supplier relations with key suppliers.
6. Creating supplier development projects for underperforming suppliers.
7. Creating strategic relationships with suppliers in order to sustain innovation.
8. Creating an innovation climate that enhances innovation and integrates suppliers and customers in the process.
9. Generating early involvement in purchasing projects in partnership with the chairs of the university.
10. Reducing complexity of involvement to reduce resistance against involvement.
11. Generating customer satisfaction through finding opportunities to help the customer reach their goals.
12. Creating awareness of the value that the Purchasing Department is generating in order to gain trust from the customer.
13. Instituting and performing Forecasting Management Practices in order to gain cost reduction and a better delivery performance.
14. Designing the forecasting processes to be adaptable towards both an internal and external setting to optimize quality.

As mentioned in the introduction this thesis will try to display the difference between strategic activities, which will benefit innovation and allow a technical university to generate and sustain a position as frontrunner in scientific research in this field and more operational, allowing the purchasing procedures and policies to be carried out efficient and effective. This is relevant to the Purchasing Department, since it displays for how certain value-adding should require university-wide involvement, while other activities can be done mostly internally and this will help the Purchasing Department with setting up an improvement plan.

In the field of Purchasing and Supply Management the following research identified 7 key areas, which are important to use in a model, as seen in figure 5, and aligned them on the basis of coverage and focus of the organization (Matopoulos, Bell, & Aktas, 2016). Since a large amount of our value-adding activities correspond with this key areas this bachelor thesis made a matrix of their value-adding activities based on the axis mentioned above.



Figure 5: purchasing & supply management themes classification.

Please note that some activities (for instance environmental activities) are not in the scope of the 7 key areas and therefore the placement of this activities in the matrix is based on the knowledge the author gained on the topic earlier in the literature review.

Focus	Organisation			1. Setting and supporting the environmental goals and strategies of their corresponding University.
		14 Designing the forecasting processes to be adaptable towards both an internal and external setting to optimize quality.	13 Instituting and performing Forecasting Management Practices in order to gain cost reduction and a better delivery performance. 10 Reducing complexity of early involvement to reduce resistance against involvement.	9 Generating early involvement in purchasing projects in partnership with the chairs of the university. 11 Generating customer satisfaction through finding opportunities to help the customer reach their goals. 12 Creating awareness of the value that the purchasing department is generating in order to gain trust from the customer.
	Function	4 Standardizing purchasing policies. 8 Creating an innovation climate that enhances innovation and integrates suppliers and customers in the process.	2 Cooperating with the suppliers of the University for eco-design. 5 Creating and sustain strong supplier relation with key suppliers. 6 Creating supplier development projects for underperforming suppliers. 7 Creating strategic relationships with suppliers in order to sustain innovation.	3 Finding recycle opportunities to generate more product value.
		Operational	Strategic	Coverage

Figure 6: Matrix value-adding activities.

This matrix provides a clear overview from on what strategic level in the purchasing process the activities and how broadly the changes should be implemented.

## 6. UT PURCHASING DEPARTMENTS CURRENT STATE

This section has as goal to determine the strengths and weaknesses of the UT Purchasing Department. In this section the results of the analysis of the UT Purchasing Department along the value-adding activities displayed in the previous section will be outlined. The data used was gathered from extensive interviews with all actors within the purchasing process. To keep the structure clear and easy to understand, the same headings will be used as in the previous section. This section has also been checked by the manager of the Purchasing Department in order to ensure that the research gave an accurate overview of the purchasing practices.

### 6.1 Environmental & Sustainability Issues

On the front of environmental procedures, it is visible that the UT Purchasing Department has an environmental policy, which is largely based on the university-wide strategy set by the Executive Board of the university. This strategy is described in the Energy Efficiency Plan and has as goal to reduce university-wide energy consumption with 30% based on the 2005 energy consumption. In this strategy there is a main focus on energy reduction methods across the University of Twente, but there is also a section mentioning the sustainability pact of the products that are acquired by the university and the need to make sure that no harm comes to either the environment and the people using the products.

The UT Purchasing Department translates this strategy in the UPI-Growth Model which is a commitment between the UT Purchasing Department and purchasing departments from other universities in the Netherlands. This model measures the sustainable purchasing of this universities by 10 parameters scoring the universities for 0-1000. This way the Purchasing Department was able to learn from other universities in terms of environmental policy. Also in the tender agreements there is always a criteria included for sustainability, which is defined together with the customers and the Tactical Purchasing Group based on the acquisition.

On the topic of recycling this is regulated in functional tender agreements regulated in cooperation with the account managers of the Facility Department, while on research materials bought there is no evidence of a recycle plan in place.

Based on this information it is visible that the environmental activities that add value are being properly conducted by the UT Purchasing Department. There is also a recycle plan available, but this could be somewhat more integrated in the research chairs to be able to find even more opportunities.

### 6.2 Standardization and Supplier Maintenance

In terms of standardization, there are no official policies in place for filling in tender agreements and addressing customers. However, during the authors time with the Purchasing Department, clear efforts of unofficial standardization between the purchasing staff are observed leading to fairly standardized tender agreements. There is also a template available for filling in a tender agreement. However this does not contain clear instruction, but rather which sections are necessary to mention. It is also worth mentioning that the UT Purchasing Department recently started with the process to acquire an E-procurement system to combine the different information and procurement systems in one place. This is done in collaboration with the

Finance Department and the Logistics Department and could be very beneficial for the streamlining of the purchasing process.

In terms of supplier maintenance it is visible that relationships with suppliers exist due to several meetings with different suppliers discussing the collaboration between the two. However it is observed that this meetings are more focused on fixing the flaws that have occurred in the product acquisitions rather than discussing development of the suppliers in order to generate innovation and improvement. In the interviews the purchasers also mentioned that flaws in delivery first reach the customers who then contact the Purchasing Department and this can be the case since the Logistics Department does not exactly know what is about to come in everyday leading to an inability to contact the Purchasing Department to fix this flaws before the customer finds out. Reviewing this information it can be stated that the Purchasing Department is sufficient in creating standardized purchasing practices despite the little formal policies that are available on it. In terms of supplier maintenance there are relationships with suppliers, but those are not strategically used to generate innovation yet. Also a development plan for underperforming suppliers is not available.

### 6.3 Innovation

In terms of innovation it is seen that the contact of the suppliers that actually sustain innovation are held by the customers who have an extensive relationship with those strategic suppliers. The possible problem that could occur is that these conversations are not monitored by the Purchasing Department, which might lead to agreements between the customer and the supplier that are not in accordance with the policies of the Purchasing Department or even worse, with the European tender laws, which could lead to lawsuits and a bad reputation for the UT.

In regard to the innovation climate, the first thing that is observed is that the Purchasing Department has an innovation plan for their staff, giving the staff responsibilities in improving the process and also prioritizing which activities are more important and will require the most time and resources. However, as mentioned in the previous section, this improvement plan would be more accurate if the customer and supplier needs are also integrated in the development plan and while there is a customer satisfaction survey, which is used to build this plan, the survey has not been responded on enough to be reliable and therefore it might be beneficial to look at another method to gain this input.

To conclude this section, this thesis states that in terms of value-adding activities the ties with strategic suppliers that add to innovation are not established but are held by the customers. The innovation environment is internally established but there could be some more (and different) integration with the suppliers and customers.

### 6.4 Early Involvement and Customer Satisfaction

Early involvement is by the staff and the management of the Purchasing Department currently displayed as the most prominent problem that the Purchasing Department has. The Purchasing Department feels that not being early involved restricts the Purchasing Department from adding value through the purchase mainly in supplier selection and monitoring compliance with tender regulations. Meanwhile the customers that where interviewed mostly feel that the complexity of the functional requirements of the research purchases will restrict the Purchasing Department from adding value in the supplier selection process. Also the customers feel that regulations are known and that the procedures the costumers use comply with this regulations.

Secondly, in terms of customer satisfaction, it should be said that all the customers that where interviewed where very pleased with how well the Purchasing Department takes their feedback and organizes the purchasing processes. However there are some chairs that do not regularly meet with the Purchase Department and these chairs do not get the full involvement of the purchasing department. It will also be hard for the Purchasing Department to gain awareness of these chair, since the main awareness methods of the Purchasing Department are through these meetings and the website of the Purchasing Department. This is why it might be useful to investigate some different methods to create awareness.

### 6.5 Forecast Management Competences

The forecasting activities that are currently conducted are mainly in the large functional tender agreements (like cleaning, catering). The customer (in this case the account managers of the Facilities Department) are heavily invested in this process. In the research chairs, there are no forecasting activities since the chairs do not always have research agendas cut out in the beginning of the year and it is very difficult to pinpoint far ahead which materials might be necessary for those researches. It is also important to note that research machines with prices above the tender limit, which is currently above 209.000 euros for supply and services contracts (European Union, 2017), have to be tendered separately and therefore it would be hard to gain scale benefits from forecasting these machines.

To conclude figure 7 shows the created model with the addition of which value-adding activities are conducted by the UT Purchasing Department and which are not conducted by the UT Purchasing Department. Based on this information the thesis can define three key areas that the UT Purchasing Department should improve on. These areas have been selected based on the fact that most of the activities which are not conducted sufficiently by the UT Purchasing Department are part of these areas, which are: Early Involvement & Customer Satisfaction; Standardization & Supplier Maintenance and Forecasting Management Practices.

Focus	Organisation			1. Setting and supporting the environmental goals and strategies of their corresponding university.
	Function	14 Designing the forecasting processes to be adaptable towards both an internal and external setting to optimize quality.	13 Instituting and performing Forecasting Management Practices in order to gain cost reduction and a better delivery performance. 10 Reducing complexity of early involvement to reduce resistance against involvement.	9 Generating early involvement in purchasing projects in partnership with the chairs of the university. 11 Generating customer satisfaction through finding opportunities to help the customer reach their goals. 12 Creating awareness of the value that the purchasing department is generating in order to gain trust from the customer.
		4 Standardizing purchasing policies. 8 Creating a innovation climate that enhances innovation and integrates suppliers and customers in the process.	2 Cooperating with the suppliers of the University for eco-design. 5 Creating and sustaining strong supplier relation with key suppliers. 6 Creating supplier development projects for underperforming suppliers. 7 Creating strategic relationships with suppliers in order to sustain innovation.	3 Finding recycle opportunities to generate more product value.
		Operational		Strategic

Figure 7: UT purchasing value-adding activities matrix.



## 7. WEBSITE SEARCH

The goal of this section is to search for practical examples of successful purchasing to be able to give more relevance to the interviews and give the UT Purchasing Department some practical goals to work towards. This search was conducted within the websites of the universities interviewed and the results are displayed below.

### 7.1 Supercomputer

The KU Leuven acquired and installed a supercomputer called “BrENIAC”. This project has been worked on by 16 different research chairs of the KU Leuven and one research chair of the university of Gent (KU Leuven, 2005). This is an excellent example of organizing the different needs of the customer in order to create value. Also it was learned that through good supplier selection and environmental responsible purchasing the university was able to achieve major savings on electricity costs and to negotiate a better price than the customers had anticipated.

### 7.2 Mass Spectrometers

The following success story shows that timely knowledge about a client’s needs and the bundling of procurement agendas can result in enormous cost savings. In 2012 the procurement coordination office of ETH Zürich was informed that the Department of Earth Sciences had appointed three new professors. In a joint meeting the procurement office found that there was a need for four new mass spectrometers. In the joint meeting the purchasing office then convinced the professors to acquire these spectrometers through a single tendering exercise. By organizing the purchasing process in this way, the purchasing office was eventually able to negotiate an overall 15 percent higher discount and therefore saved several hundred thousand Swiss franc for the university (ETH Zürich, 2012, p. 39).

### 7.3 Paper recycle project

The following project shows that even in facility purchases it is still possible to innovate and in this case be more environmentally friendly and lower costs. In 2010 the purchasing office of the University of California, Santa Cruz developed a paper recycle project in order to reduce paper waste. The goal of this project was to transition from virgin paper, which is totally newly manufactured paper, into post consumer waste (PCW) paper, which is paper that is recycled after customer use. In the school year of 2015-2016 the procurement department was able to make sure that 69,95% of all paper purchased was post consumer waste paper. This project provided a major contribution towards the universities Sustainable Practices Policy (UCSC procurement services, 2017).

### 7.4 Surplus property system

Lastly, this success story describes how a purchasing department can bring customers together in order to optimize resource usage. The University of California, Irvine created an surplus property system in their intranet called “Peter’s Exchange” which allows different departments to report it when there is a surplus of a certain acquisition and can then sell it to another department who is in need for it. This has led to a reduction in waste by the departments and made sure the resources acquired are fully used before disposing them.

In conclusion, this website research found different success stories that helped the thesis with practical information for the interviews with the universities and can give the UT Purchasing Department some practical examples of the benefits that come from conducting the value-adding activities.

## 8. BEST PRACTICES TOP UNIVERSITIES

This section will display the findings of the interviews that were held with different high-ranking peer universities and has as goal to supply the UT Purchasing Department with some best practices that the Purchasing Department can use to help improve the value-adding activities that are not optimally conducted yet. In order to give the most detailed help the interview focused on the three areas earlier defined on which the UT Purchasing Department could gain the most improvement, as explained in the conclusion of section 6, which are the following: Early Involvement & Customer Satisfaction; Standardization and Supplier Maintenance and Forecast Management Practices.

### 8.1 Early involvement & customer satisfaction

The universities interviewed are in agreement with the importance that the UT Purchasing Department gives towards the early involvement problem, stating that it is one of the big challenges of any university purchasing department. The universities shared suggestions in the following areas: Professor target group, creating awareness and diversification of the staff.

#### 8.1.1 Professor target group

When approaching professors to change their involvement with the Purchasing Department in the purchasing process it is most effective when there is a focus on professors that are early in their career at the UT. These professors are usually more willing to change, since the professors still do not have standard procedures of how to communicate with the Purchasing Department and are more willing to accept this early involvement, since the professors are not familiar with the purchasing policies of the UT and therefore are happy that someone is available to help out. The procurement office of ETH Zürich usually is informed by the Executive Board when new professors are being appointed and those professors are invited for a meeting, where the professors’ needs are being discussed alongside with an explanation of the university purchasing procedures and policies. Also the value that the purchasing department can bring in activities like supplier selection, determining functional requirements and complying with tender regulations is explained.

#### 8.1.2 Creating awareness

When there are success stories created with these professors it is important to share this with other professors. The easiest way to do this according to UC, Santa Cruz is through their quarterly newsletter. Besides using it to share the Purchasing Departments own values and strategy together with practical examples, it could also be beneficial to share some of the stories of the professors themselves. This will attract fellow professors to read the newsletter if one of their colleagues is featured in the newsletter and gives the featured professor a chance to promote his research.

#### 8.1.3 Diversification of the staff

Every university interviewed had members of staff from different study backgrounds. It was suggested that this helped to create a deeper understanding of the market if necessary. Take for example the acquisition of the super computer. The purchasing department of KU Leuven would not have been able to coordinate all needs of their 16 customers, without some technical understanding about their requirements. Also a technical understanding can help a purchaser in making an assessment of which effects certain cost savings will have on the quality of an acquisition, which makes for a stronger negotiating position.

## 8.2 Standardization and Supplier Maintenance

The findings about this area will be discussed in three headings: E-procurement system; Supplier Feedback and Supplier Development.

### 8.2.1 E-procurement system

Most of the universities that are interviewed had an E-procurement system and since the UT Purchasing Department is trying to acquire one, the author believed it to be useful to ask which criteria these universities value in an E-procurement system. Most mentioned was the integration of the different actors of the purchasing process. This integration was important because it allows for faster information exchange and quick lead times of orders. Secondly, the usability of the system is very important. The system should not be complicated to use, in order to quickly be able to train staff and customers into using this system and quickly be able to perform the job necessary. Lastly, the aesthetics are important. The system needs to look appealing for the user in order to give a purchasing department a professional image.

### 8.2.2 Supplier Feedback

In order to decide which suppliers are underperforming and should be developed or replaced it is important to get the right supplier feedback. The interviewed universities mentioned several criteria are important to be measured. Firstly, the lead time of orders is important to ensure flexibility and compliance with the customers wishes. Secondly, innovativeness is important to be able to gain and sustain a position as one of the best technical universities. Lastly it is important that the supplier produces in an environmentally friendly way to be able to contribute to the environmental policies of the universities within the supply chain.

### 8.2.3 Supplier Development

In terms of supplier development it was found that university purchasing departments are reluctant on doing this with suppliers since it is very time intensive and this might interfere with the relationship of the customer. The only time when supplier development is conducted is when a supplier holds a monopoly in a certain business area since the purchasing departments will not be able to replace these companies. Also important to note is that the UC, Irvine and Santa Cruz mention that new suppliers that join always have to go through a 1-day training in which these suppliers learn about the purchasing policies of the university and the responsibility of the university towards among others the environment and the city of California.

## 8.3 Forecasting Management Practices

According to the universities, forecasting activities in research and innovative acquisition are rarely conducted since the purchasing departments feel that this is rarely effective due to the fact that the research departments are providing their needs on a short-term basis. Forecasting does happen though. For example in the acquisition of the mass spectrometers, but the purchasing department from ETH Zürich responded that this is mainly a side-effect of their good information system rather than explicit efforts from the purchasing department to find out these purchasing agendas.

## 9. DISCUSSION

Now that the results of the investigation are fully displayed this bachelor thesis will be concluded by answering the research questions asked in the beginning of this thesis.

## 9.1 Combining all information

The sub-question a) addresses which activities should be important for a purchasing department to really add value towards an organization. This thesis defined 14 different value-adding activities based on articles from the 3 top journals in the field of Purchasing and Supply Management. This value-adding activities came from diversified topics such as the following: Environmental & Sustainability issues; Standardization and Supplier Maintenance; Innovation; Early Involvement and customer satisfaction and Forecasting Management Competences. This activities are then distributed in a matrix which defines these activities over the 7 key areas of Purchasing and Supply Management to provide a clear picture of which activities are more strategic and which activities require university-wide focus.

With this model, this thesis was able to analyze the current status of the UT Purchasing Department in order to address sub-question b) through interviews with different actors within the purchasing process. It was found that the UT Purchasing Department was conducting the following value-adding activities properly:

1. Setting and supporting the environmental goals and strategies of their corresponding university.
4. Standardizing purchasing policies.
5. Creating and sustaining strong supplier relations with key suppliers.
8. Creating an innovation climate that enhances innovation and integrates suppliers and customers in the process.

Also the following value-adding activities were conducted but not in all areas of the purchasing process:

3. Finding recycle opportunities to generate more product value.
  11. Generating customer satisfaction through finding opportunities to help the customer reach their goals.
  12. Creating awareness of the value that the Purchasing Department is generating in order to gain trust from the customer.
- Lastly, the following value-adding activities were conducted insufficiently:
2. Cooperating with the suppliers of the university for eco-design.
  6. Creating supplier development projects for underperforming suppliers.
  7. Creating strategic relationships with suppliers in order to sustain innovation.
  9. Generating early involvement in purchasing projects in partnership with the chairs of the university.
  10. Reducing complexity of involvement to reduce resistance against involvement.
  13. Instituting and performing Forecasting Management Practices in order to gain cost reduction and a better delivery performance.
  14. Designing the forecasting processes to be adaptable towards both an internal and external setting to optimize quality.

Based on this information the thesis can define three key areas that the UT Purchasing Department should improve on, which are: Early Involvement & Customer Satisfaction; Standardization & Supplier Maintenance and Forecasting Management Practices.

In order to answer the last sub-question, various universities purchasing websites were searched in order to find success

stories of purchasing departments who were able to add value to their university. Also several high-ranking universities were interviewed in order to define some best practices to help improve the UT Purchasing Departments key areas to improve. When looking at Early Involvement it became clear that targeting professors who are early in their career are more willing to early involve the Purchasing Department, a quarterly newsletter of the Purchasing Departments accomplishments could help raise awareness for the value that the Purchasing Department brings to the university. Also diversified backgrounds in staff could help in gaining a more technical insight in the needs of the Purchasing Departments customers. On the area of Standardization & Supplier Maintenance it became visible that important criteria for an E-procurement system are integration, usability and aesthetics. Also while recording supplier feedback lead time, innovativeness and environmentally friendliness are good criteria to help determine which suppliers are underperforming. Lastly, purchasing departments are usually reluctant to engage in supplier development due to the time consuming process and the possibility of hurting supplier relations with the customers. Therefore, this is only conducted when a supplier holds a monopoly in the supplier's respective business area and therefore cannot be replaced.

## 9.2 Conclusion

Finally now that all the sub-questions have been answered the research question can be answered. The value of the UT Purchasing Department towards the UT, which has been defined by 14 different value-adding activities mentioned in this thesis, can be optimized by improving in their Early Involvement & Customer Satisfaction; Standardization & Supplier Maintenance and their Forecasting Management Competences. This can be done by among others targeting professors, who are early in their UT career for early involvement, creating awareness by starting a quarterly newsletter and acquiring an e-procurement system which has a high integration level into different departments, is very usable and has a good aesthetic.

## 10. IMPLEMENTATION AND LIMITATIONS

### 10.1 Recommendations for Practice

The UT Purchasing Department should integrate the best practices of the universities into their yearly development plan and it is recommended to use the resources that the UT has available in order to find effective and low cost improvements. For instance the UT Purchasing Department could offer some technical students to do a market analysis about the innovations of suppliers in a certain industry for these students thesis. This can lead to a deeper technical understanding of the development from the market, while at the same time gaining supplier feedback on the innovativeness of the Purchasing Departments supplier compared to the market. Also a good example would be to use the UT news, which is a magazine published by the UT to give training to the staff member who will be responsible for writing the newsletter to provide the staff member with tips on how to make the newsletter appealing and easy to read.

### 10.2 Limitations

There are some limitations towards this research but the most significant one is that the interviews that were held with the actors of the UT purchasing process are all been setup through the contacts of the Purchasing Department itself. This might subjectively influence the interview results since the actors that are being interviewed probably have a good relationship with the Purchasing Department. Also since the improvement plan is specifically designed to help the one case of the UT Purchasing Department it might not be generalizable to other university

purchasing departments. However the value-adding activities defined in this thesis could still be used for a purchasing department to evaluate themselves. Lastly, since there is only one author for this thesis interviewer bias might have occurred and therefore the results should be verified by follow-up talks by other interviewers with the interviewees to eliminate this bias.

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