

Le, Fabienne

Article

How Do Companies Communicate Sustainability: A Semantic Analysis of German Automotive Manufacturers

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Online-Appendix zu

„How Do Companies Communicate Sustainability: A Semantic Analysis of German Automotive Manufacturers“

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Junior Management Science 9(1) (2024) 1123-1139

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A1 LSA-Python code

```
#import modules used for LSA
import os.path
from gensim import corpora
from gensim.models import LsiModel
from nltk.tokenize import RegexpTokenizer
from nltk.corpus import stopwords
from nltk.stem.porter import PorterStemmer
from gensim.models.coherencemodel import CoherenceModel
from nltk.stem.wordnet import WordNetLemmatizer
import matplotlib.pyplot as plt
import cleantxt as text

# retrieved from:
https://www.datacamp.com/tutorial/discovering-hidden-topics-
python; with some modificatiосn
#Loading data sample into project
def load_data(path, file_name):
    """
    Input : path and file_name
    Purpose: loading text file
    Output : list of paragraphs/documents and
            title(initial 100 words considred as title of
document)
    """
    documents_list = []
    titles=[]
    with open( os.path.join(path, file_name),"r") as fin:      #
insert document path here
        for line in fin.readlines():
            text = line.strip()
            documents_list.append(text)
    print("Total Number of Documents:",len(documents_list))
    titles.append( text[0:min(len(text),100)] )
    return documents_list,titles

#Cleaning data
def preprocess_data(doc_set):
    """
    Input : documnt list
    Purpose: preprocess text (tokenize, removing stopwords,
and stemming)
    Output : preprocessed text
    :type doc_set: object
    """
    # initialize regex tokenizer used for tokenization
(separating each word into its own unit)
    tokenizer = RegexpTokenizer(r'\w+')

    # create English stop words list", downloading words add
```

```
little value to context to eliminate them later
    from nltk.corpus import stopwords
    stopwords= stopwords.words('english')    # traditional word
list
    #new stopwords added that are specific to the automotive
industry as well as other words with little value, e.g.,
weekdays
    new_stopwords =["mercedes", "benz", "daimler", "january",
"february", "march", "april", "may", "june", "july", "august",
"september", "october", "november", "december", "audi",
"volkswagen", "BMW", "car", "truck", "golf", "again",
"to", "and", "also", "then", "equally", "identically",
"uniquely", "like", "as", "too", "moreover", "well",
"together", "of", "likewise", "comparatively", "similary",
"furthermore", "additionally", "notably", "including", "sure",
"namely", "chiefly", "truly", "indeed", "certainly", "surely",
"clarify", "demonstrate", "especially", "surprisingly",
"specifically", "expressively", "frequently", "significantly",
"henceforth", "generally", "thus", "hence", "because", "of",
"then", "for", "consequently", "therefore", "thereupon",
"forthwith", "accordingly", "after", "but", "still", "unlike",
"or", "yet", "while", "albeit", "besides", "instead", "whereas",
"despite", "conversely", "otherwise", "however", "rather",
"nevertheless", "nonetheless", "regardless",
"notwithstanding", "above", "if", "unless", "whenever",
"since", "while", "that", "lest", "due", "given", "only",
"owing", "middle", "left", "right", "side", "center",
"next", "over", "near", "from", "above", "below", "down",
"Between", "further", "beyond", "nearby", "wherever",
"around", "before", "alongside", "amid", "among", "beneath",
"beside", "behind", "across", "time", "same", "with",
"immediately", "henceforth", "eventually", "til", "once",
"about", "next", "now", "formerly", "suddenly", "shortly",
"meanwhile", "straightaway", "instantly", "presently",
"occasionally", "overall", "ordinarily", "summary",
"altogether", "usually", "either", "rather",
"prior", "neither", "whether", "whatever", "whichever",
"whoever", "whom", "whose", "why", "so", "yes", "no",
"increasing", "make", "Germany", "Wolfsburg", "munich",
"month", "week", "day", "identified", "providing", "current",
"offer", "van", "group", "vehicle", "statement", "generate",
"lease", "right", "one", "million", "note", "non", "combine",
"total", "date", "well", "ment", "ing", "merced", "km",
"million", "b", "p", "meet", "measure", "include", "make",
"consolidate", "bus", "ag", "corporation", "company", "firm",
"discuss", "explain", "inform", "example", "country",
"assess", "international", "declare", "use", "daily", "weekly",
"monthly", "yearly", "annually", "derive", "old", "SUV",
"period", "merced", "board", "ear", "co", "member", "e",
"require", "first", "fleet", "gmbh", "order", "provide",
"generate", "batteries", "declare", "take", "inform", "come",
```

"expect", "achieve", "group", "assess", "industry",
"define", "service", "board", "propose", "basic", "ensure",
"meet", "appoint", "proportion", "train", "road", "remunerate",
"annual", "year", "note", "rate", "new", "use", "system",
"corporation", "including", "response", "vehicle",
"review", "continue", "issue", "date", "regard", "recognize",
"made", "car", "discuss", "obligation", "truck", "car",
"proceed", "follow", "significant", "german", "achieve", "million",
"right", "billion", "two", "report", "inform",
"take", "address", "digit", "van", "note", "associate", "per",
"state", "define", "national", "worldwide", "local", "kwh",
"china", "fuel", "percent", "free", "see", "mercedesbenz",
"note", "consolidate", "combine", "car", "corporation",
"mobile", "van", "truck", "inform", "meet", "according",
"within", "provide", "end", "start", "assess",
"establish", "part", "possible", "arise", "foreign", "regularly",
"receive", "set", "take", "determine", "derive", "number",
"automotive", "relevant", "drive", "adjust", "recognize",
"key", "follow", "area", "obligation", "net", "expensive",
"paid", "implements", "technical", "generate", "digital",
"recognize", "right", "primarily", "shown", "table",
"european", "europe", "define", "year", "term",
"allow", "manufacturer", "state", "affect", "high", "exist",
"various", "average", "show", "would", "method", "less",
"statement", "use", "relate", "mobil", "remunerated",
"addition", "product", "car", "held", "dealt", "expect",
"whether", "electric", "adopt", "review", "require", "result",
"relate", "effect", "continue", "calculate", "present",
"program", "perform", "participate", "globally", "value",
"carryforward", "demand", "term", "currency", "impair",
"lead", "operate", "diesel", "dispose", "statement", "note",
"report", "mobil", "amount", "flow", "inform", "combine",
"receive", "amount", "achievements", "use", "remunerate",
'active', 'result', 'effect', "present", 'increase', 'measure',
'recognize', 'plan', 'active', 'currency', 'committee', 'use',
'company', 'intern', 'interim', 'require', 'corporate',
'response', 'perform', 'supervisory', 'basic', 'extern',
'unit', 'connect', 'adjust', 'accord', 'prepare', 'figure',
'limit', 'application', 'figure', 'limit', 'process',
'calculate', 'proceed', 'consist', 'model', 'approve',
'standard', 'comprehensive', 'define', 'ltd', 'actual', 'bonus',
'review', 'discuss', 'application', 'van', 'share', 'import',
'car', 'time', 'truck', 'item', 'expect', 'institute', 'bus',
'contractures', 'particular', 'meet', "follow", "allocate",
"similar", "decrease", "determine", "adopt", "indicate",
"balance", "exchange", "show", "section", "conduct", "price",
"defer", "case", "situation", "reconciliation", "transform",
"retire", "combine", "unit", "response", "intern", "change",
"amount", "vehicle", "data", "product", "car", "pension",
"work", "external", "issue", "system", "represent",
"appropriate", "establish", "individual", "take", "provision",

```
"component", "model", "use", "assess", "discuss" "truck",
"structure", "continue", "associate", "framework" "approve",
"organize" "official", "right", "function", "decision",
"longterm", "major", "hold", "author", "detail", "region",
"drive", "adjust" "oblige", "intangibl", "value", "member",
"comprise", "range", "describe", "thereof", "impair", "ltd",
"gain", "similar", "item", "plant", "occurance", "offer",
"remain", "refund", "ppsp", "propose", "cooper", "brazil",
"launch", "slightly", "higher", "bmw", "america", "prior",
"consumption", "three", "candid", "chief", "germany", "via"]
stopwords.extend (new_stopwords)

# Create wordnet_lemmatizerto find related forms of a word
wordnet_lemmatizer = WordNetLemmatizer ()
# Create p_stemmer of class PorterStemmer, returning the
term to its root to reduce number of terms in a text
p_stemmer = PorterStemmer()
# list for tokenized documents in loop to repeat the
cleaning process for the entire document
texts = []
# loop through document list
for i in doc_set:
    # clean and tokenize document string
    raw = i.lower()
    tokens = tokenizer.tokenize(raw)
    #remove short words
    tokens= [ i for i in tokens if len(i) >2 ]
    # remove stop words from tokens
    tokens = [i for i in tokens if not i in stopwords]
    # lemmatize tokens
    tokens = [wordnet_lemmatizer.lemmatize(i) for i in
tokens]
    # stem tokens
    tokens = [p_stemmer.stem(i) for i in tokens]
    # add tokens to list
    texts.append(tokens)
return texts
def prepare_corpus(doc_clean):
    """
    Input : clean document
    Purpose: create term dictionary of our corpus and
    Converting list of documents (corpus) into Document Term
    Matrix
    Output : term dictionary and Document Term Matrix
    """
    # Creating the term dictionary of our corpus, where every
    unique term is assigned an index. dictionary =
    corpora.Dictionary(doc_clean)
    dictionary = corpora.Dictionary(doc_clean)
    # Converting list of documents (corpus) into Document Term
    Matrix using dictionary prepared above.
```

```
    doc_term_matrix = [dictionary.doc2bow(doc) for doc in
doc_clean]
    # generate LDA model
    return dictionary,doc_term_matrix

def create_gensim_lsa_model(doc_clean,number_of_topics,words):
    """
    Input : clean document, number of topics and number of
words associated with each topic
    Purpose: create LSA model using gensim
    Output : return LSA model
    """
    dictionary,doc_term_matrix=prepare_corpus(doc_clean)
    # generate LSA model
    lsamodel = LsiModel(doc_term_matrix,
num_topics=number_of_topics, id2word=dictionary) # train
model
    print(lsamodel.print_topics(num_topics=number_of_topics,
num_words=words))
    return lsamodel

def compute_coherence_values(dictionary, doc_term_matrix,
doc_clean, stop, start=2, step=1):
    """
    Input : dictionary : Gensim dictionary
corpus : Gensim corpus
texts : List of input texts
stop : Max num of topics
    purpose : Compute c_v coherence for various number of
topics
    Output : model_list : List of LSA topic models
coherence_values : Coherence values
corresponding to the LDA model with respective number of
topics
    """
    coherence_values = []
    model_list = []
    for num_topics in range(start, stop, step):
        # generate LSA model
        model = LsiModel(doc_term_matrix,
num_topics=number_of_topics, id2word=dictionary) # train
model
        model_list.append(model)
        coherencemodel = CoherenceModel(model=model,
texts=doc_clean, dictionary=dictionary, coherence='c_v')
coherence_values.append(coherencemodel.get_coherence())
    return model_list, coherence_values

def plot_graph(doc_clean,start, stop, step):
    dictionary,doc_term_matrix=prepare_corpus(doc_clean)
```



```
    model_list, coherence_values =
compute_coherence_values(dictionary,
doc_term_matrix, doc_clean,
stop, start, step)
    # Show graph
    x = range(start, stop, step)
    plt.plot(x, coherence_values)
    plt.xlabel("Number of Topics")
    plt.ylabel("Coherence score")
    plt.legend(("coherence_values"), loc='best')
    plt.show()
start, stop, step = 2, 30, 1
document_list, titles = load_data("/Users/fabiennele/PycharmProjects/Bachelor Thesis 2.0/Volkswagen/Legislators
", "VW_legislator_rawdata.txt")
clean_text = preprocess_data(document_list)
plot_graph(clean_text, start, stop, step)

#%%
#from plotted graph the correct number of topics was
identified to model the LSA; insert number in number_of_topics
# create LSA Model
number_of_topics =
words = 50
document_list, titles = load_data("/Users/fabiennele/PycharmProjects/Bachelor Thesis 2.0/Volkswagen/Legislators
", "VW_legislator_rawdata.txt")
clean_text = preprocess_data(document_list)
model = create_gensim_lsa_model(clean_text, number_of_topics, words
)
```

A2 Twitter post scraper code

```
#import scraper modules to extract posts from Twitter
import snsrape.modules.twitter as sntwitter
import pandas as pd
import csv

#Open/ create a file to append data to
csvFile = open("VW_consumers_tweetsUK", 'a')
csvWriter = csv.writer(csvFile)

# Creating list to append tweet data to
tweets_list1 = []

# Using TwitterSearchScraper to scrape data and append tweets
to list
for i, tweet in
enumerate(sntwitter.TwitterSearchScraper('from:UKVolkswagen
```

```

since:2019-01-01 until:2021-12-31').get_items()):#from: to
search specific Twitter account, "since:" and "until" to
define the timeframe for scraped tweets

    if i >100000:
        break
    tweets_list1.append([tweet.date,tweet.content,
tweet.user.username])
    csvWriter.writerow(
[tweet.date,tweet.content,tweet.user.username])
csvFile.close() #saving all posts extracted in a csv file

```

A3 Mercedes-Benz shareholders: topic themes & CV graph

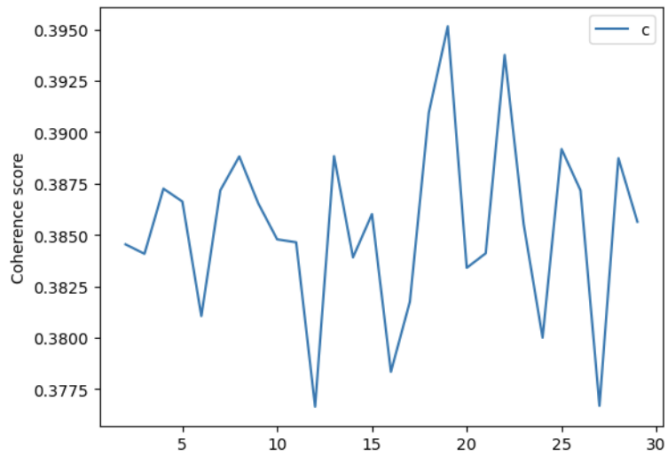
Mercedes-Benz Shareholders: topic themes

| Topic number | Terms | Theme | TBL class |
|--------------|--|---|-------------|
| 1 | 0, '0.768*"financi" + 0.417*"statement" + 0.414*"consolid" + 0.156*"note" + 0.075*"manag" | Financial performance | Economic |
| 2 | 0'0.762*"manag" + 0.521*"risk" + 0.129*"combin" + 0.113*"opportun" + - 0.094*"consolid" | Financial performance | Economic |
| 3 | '0.724*"risk" + -0.580*"manag" + 0.134*"opportun" + -0.109*"combin" + 0.104*"market" | Financial Performance | Economic |
| 4 | '0.327*"busi" + -0.325*"risk" + 0.287*"develop" + 0.280*"servic" + 0.256*"asset" | Sales | Economic |
| 5 | '0.471*"asset" + -0.376*"develop" + - 0.292*"consolid" + -0.280*"busi" + - 0.259*"statement" | Sustainable reporting | Environment |
| 6 | '0.410*"servic" -0.375*"market" 0.340*"busi -0.323*"asset" | Integration of sustainability for business growth | Environment |
| 7 | 0.499*"busi" + -0.450*"cash" + 0.360*"servic" + 0.255*"sale" + 0.195*"financi" " | Strategic reorientation/ Product strategy | Economic |
| 8 | 0.574*"develop" + 0.362*"cash" + 0.249*"sale" + 0.204*"vehicl" + 0.200*"servic" | Sale of products & services (sales) | Economic |

B.Sc. Thesis – How do companies communicate sustainability: a semantic analysis of German automotive manufacturers

| | | | |
|----|---|--|----------|
| 9 | '0.424*"market" + -0.322*"servic" + - 0.294*"tax" + 0.288*"instrument" + 0.276*"hedg" | Financial performance, disclosure to stakeholders | Economic |
| 10 | 0.422*"busi" + 0.340*"develop" + - 0.322*"asset" + -0.318*"sale" + 0.280*"cash" | Financial Performace | Economic |
| 11 | '0.371*"tax" + -0.302*"cash" + 0.296*"loss" + 0.251*"interest" + -0.233*"sharehold" | Reporting/ Auditing/ Compliance | Economic |
| 12 | , '0.314*"complianc" + -0.289*"cash" + - 0.283*"develop" + 0.283*"legal" + 0.234*"measur" | Labor practices | Social |
| 13 | 0.807*"target" + -0.324*"achiev" + 0.220*"market" + 0.141*"audit" + - 0.140*"remuner" | Benchmarking | Economic |
| 14 | .648*"interest" + -0.303*"loss" + 0.223*"incom" + 0.219*"expens" + - 0.183*"complianc" | Shareholder / market value growth | Economic |
| 15 | -0.558*"tax" + 0.307*"interest" + - 0.297*"market" + -0.253*"sharehold" + - 0.216*"audit" | Compliance/ Auditing | Economic |
| 16 | '0.415*"market" + -0.358*"sharehold" + 0.309*"complianc" + -0.260*"sale" + - 0.255*"meet" | Business compliance | Economic |
| 17 | '0.649*"truck" + 0.305*"bu" + -0.270*"sale" + -0.248*"loss" + 0.199*"liabil" | Product sales | Economic |
| 18 | 0.555*"liabil" + -0.390*"mobil" + 0.229*"complianc" + 0.215*"tax" + - 0.199*"remuner" | Regulations of business operations | Economic |

Mercedes-Benz shareholder CV:

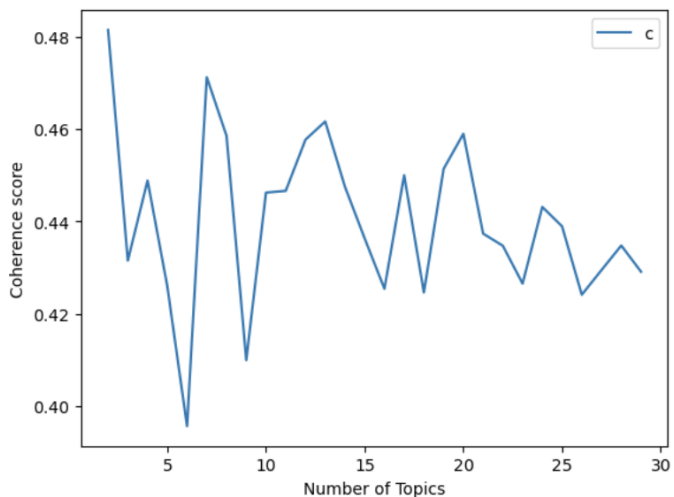


A4 Audi shareholders: topic themes & CV graph

Audi Shareholders: topic themes

| Topic number | Terms | Theme | TBL class |
|--------------|--|---|-----------|
| 1 | -0.911*"product" + -0.177*"servic" + -0.172*"sustain" + - 0.164*"employe" + -0.090*"emiss" | Financial performance | Economic |
| 2 | 0.708*"vote" 0.680*"right" 0.071*"amount" 0.057*"attribut" 0.054*"law" | Policies/ Integeration of stakeholders | Social |

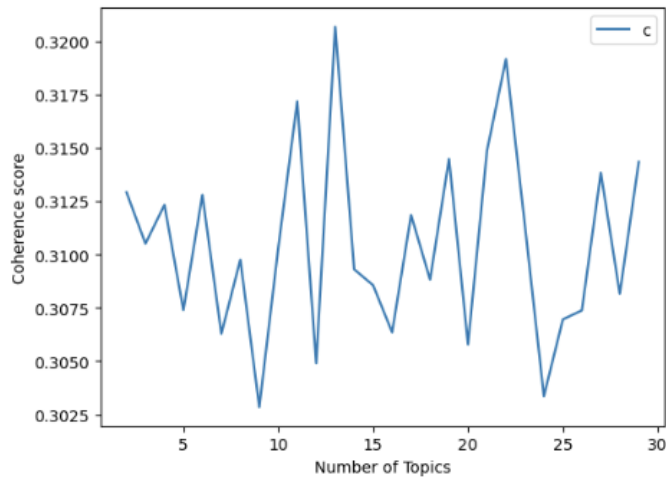
Audi shareholders CV:



A5 Volkswagen shareholders: topic themes & CV graph

| Volkswagen Shareholders: topic list | | | |
|--|--|--|-----------|
| Topic number | Terms | Theme | TBL class |
| 1 | 0.767*"financi" +0.378*"statement" +0.378*"consolid" +0.156*"asset" +0.142*"note" | Financial performance/ Balance sheet evaluation | Economic |
| 2 | '0.644*"manag" +0.541*"risk"+ 0.162*"hedg" + - 0.155* "consolid",0.149*"statement" | Financial performance | Economic |
| 3 | 0.627*"manag" +0.306*"asset" +0.192*"market" +0.186*"hedg" +0.173*"tax" | Financial performance | Economic |
| 4 | 0.691*"risk" +0.314*"manag" + - 0.252*"hedg" +0.220*"asset" +0.194*"sale" | Sales | Economic |
| 5 | -0.453*"asset" +0.436*"market" +0.390*"vehicl" + -0.178*"loss" +0.178*"commerci" | Market & brand value | Economic |
| 6 | '0.469*"hedg"+-0.395*"asset" +0.339*"tax" + 0.251*"cash" + -0.247*"risk" +0.237*"consolid" | Financial performane | Economic |
| 7 | 0.481*"vehicl" + -0.463*"market" + - 0.283*"develop" + -0.283*"cost" +0.225*"commerci" | Car/ product development | Economic |
| 8 | '0.614*"tax" + -0.436*"hedg" +0.231*"risk" + -0.178*"fair" + -0.158*"cost" | Accounting | Economic |
| 9 | 0.523*"sale" + -0.353*"cash" + -0.315*"tax" +0.253*"revenu" + -0.211*"servic" | Sales/ revenue | Economic |
| 10 | -0.435*"cash" + -0.381*"asset" +0.346*"loss"+0.250*"servic" + -0.222 *"oper" | Financial performance | Economic |
| 11 | -0.420*"develop" + 0.412*"sale" +0.280*"market" + -0.239*"cost" + - 0.231*"vehicl" | Market strategy/ brand development | Economic |
| 12 | '0.555*"loss" + -0.388*"liabil" + - 0.349*"hedg" + 0.226*"oper" + 0.217*"profit" | Financial Performance | Economic |
| 13 | -0.592* "liabil" + 0.363*"brand" + -0.232 *"vehicl" +0.228*"passeng" + 0.224*"tax" | Relation between car brand and firm value | Economic |

Volkswagen shareholders CV:



A6 BMW shareholders: topic themes & CV graph

BMW Shareholders: topic list

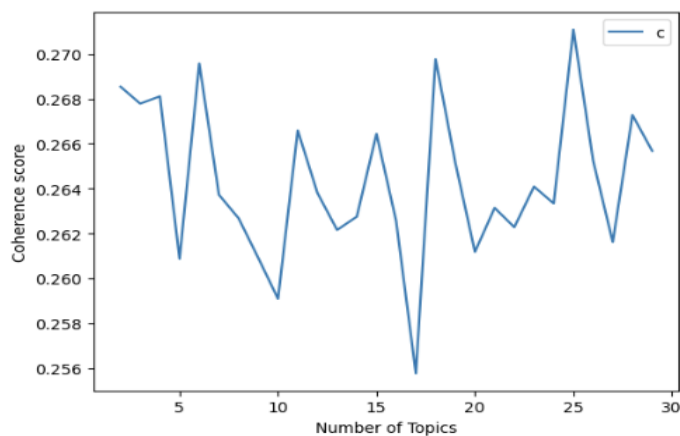
| Topic number | Term | Theme | TBL class |
|--------------|--|---|-----------------------|
| 1 | '0.701*"financi" + 0.385*"manag" + 0.259*"risk" + 0.243*"statement" + 0.182*"remuner" | Financial reporting | Economic |
| 2 | '0.720*"manag" + -0.536*"financi" + 0.249*"risk" + 0.188*"combin" + 0.138*"remuner" + | Outlook of financial/business strategy concerning resources and materials | Economic |
| 3 | '0.674*"risk" + -0.416*"remuner" + -0.267*"statement" + -0.225*"govern" + -0.207*"nformat" | Outlook of financial/business strategy concerning resources and materials | Economic/ Environment |
| 4 | -0.481*"manag" + 0.478*"risk" + 0.461*"remuner" + 0.233*"govern" + -0.216*"financi" | Impact investing | Environment/ Economic |
| 5 | -0.315*"risk" +0.305*"cash" +0.240*"asset" + -0.235*"financi" +0.213*"invest" | Sales | Economic |
| 6 | -0.560*"cash" +0.361*"product" +0.273*"servic" + -0.222*"invest" +0.182*"develop" | Environmental-friendly products | Economic |

| | | | |
|----|--|---|----------------------------|
| | | and their market performance | |
| 7 | -0.497*"asset" +-0.325*"tax" +0.305*"cash" +0.295*"servic" +-0.211*"incom" | Financial performance | Economic |
| 8 | -0.481*"segment" +-0.481*"servic" +0.267*"emiss" +-0.194*"tax" +0.182*"statement" | Compliance to environmental regulations | Environmental |
| 9 | '0.583*"asset" +-0.337*"tax" +0.336*"product" +-0.231*"incom" +0.199*"cash" | Financial performance | Economic |
| 10 | -0.439*"product" +0.402*"segment" +0.296*"emiss" +0.278*"target" +0.238*"inform" | Financial performance disclosure | Economic |
| 11 | -0.435*"remuner" +0.322*"cash. +0.313*"asset" +0.261*"statement" ++0.258*"invest" | Carbon emission footprint of product | Environment |
| 12 | 0.466*"unit" +-0.403*"tax" +0.318*"emiss" +-0.287*"product" +0.203*"market" | Reporting of sustainable supply chain/ product | Environment |
| 13 | -0.681*"unit" +-0.346*"tax"+ 0.299*"cost" + 0.279*"develop" +- 0.173* "joint" | Reporting of sustainable supply chain/ product / alliances | Environment |
| 14 | -0.581*"inform" + -0.347*"report" + 0.334*"target" + 0.223*"unit" + 0.218*"develop" | Meeting target/ reporting | Economic |
| 15 | 0.581*"develop" + -0.344*"capit" + - 0.255*"product" + 0.232*"inform" + - 0.222*"market" | Developments of environmental-friendly cars for market value increase | Economic/ Environmental |
| 16 | -0.476*"emiss" + -0.276*"cost" + 0.267*"target" + 0.265*"product" + - 0.256*"carbon" | Compliance to meet target of carbon emission reduction | Environmental |
| 17 | '0.449*"market" + 0.357*"develop" + - 0.249*"target" + 0.244*"capit" + 0.215*"inform" | Conforming and reporting of policies | Economic |
| 18 | -0.461*"inform" + 0.335*"invest" + 0.321*"account" + 0.248*"servic" + 0.243*"report" | Compliance to regulations | Economic |

B.Sc. Thesis – How do companies communicate sustainability: a semantic analysis of German automotive manufacturers

| | | | |
|----|---|---|--------------------------|
| 19 | $-0.344 \cdot \text{"loss"} + -0.308 \cdot \text{"report"} + 0.241 \cdot \text{"invest"} + -0.212 \cdot \text{"segment"} + -0.210 \cdot \text{"perform"}$ | Market value and performance | Economic |
| 20 | $-0.307 \cdot \text{"tax"} + 0.304 \cdot \text{"loss"} + 0.303 \cdot \text{"incom"} + 0.284 \cdot \text{"invest"} + -0.239 \cdot \text{"perform"}$ | Market performance | Economic |
| 21 | $0.371 \cdot \text{"market"} + -0.312 \cdot \text{"employe"} + 0.306 \cdot \text{"target"} + -0.257 \cdot \text{"emiss"} + 0.235 \cdot \text{"combin"}$ | Environmental measures and its implication for stakeholders | Economic & Environmental |
| 22 | $-0.351 \cdot \text{"sale"} + -0.310 \cdot \text{"financ"} + 0.309 \cdot \text{"hedg"} + 0.283 \cdot \text{"cost"} + 0.260 \cdot \text{"capit"}$ | Supply chain of raw materials / sustainable supply chain | Environment |
| 23 | $-0.318 \cdot \text{"report"} + -0.281 \cdot \text{"target"} + 0.237 \cdot \text{"vehicl"} + -0.229 \cdot \text{"account"} + 0.209 \cdot \text{"materi"}$ | Reporting/ auditing/ accounting | Economic |
| 24 | $0.495 \cdot \text{"vehicl"} + -0.292 \cdot \text{"market"} + 0.189 \cdot \text{"electr"} + 0.188 \cdot \text{"loss"} + 0.184 \cdot \text{"cost"}$ | Market performance due to corona virus external factors | Environmental |

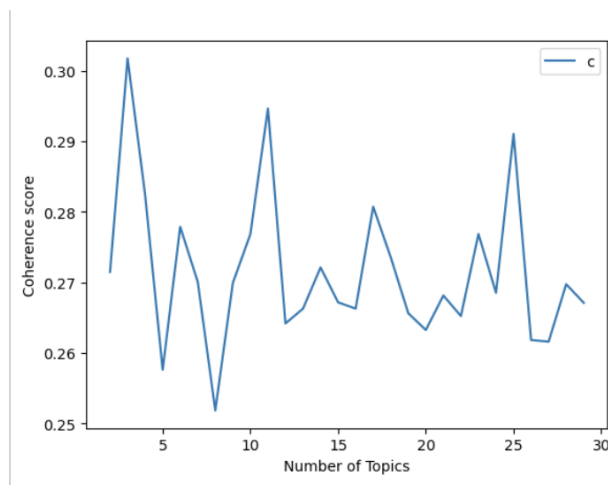
BMW shareholders CV:



A7 Mercedes-Benz legislation: topic themes

| Mercedes Legislation: topic themes | | | |
|------------------------------------|---|---|---------------|
| Number of topics | Term | Theme | TBL class |
| 1 | 0.696*"sustain" + - 0.360*"manag" + - 0.197*"develop" + - 0.148*"busi" + - 0.144*"risk" | Sustainable supply chain addressing environment and climate change in production & business operation | Environmental |
| 2 | -0.628*"sustain" + 0.536*"manag" + 0.319*"employe" + 0.210*"complianc" + 0.194*"risk" | Employee protection and work environment | Social |
| 3 | 0.608*"manag" + 0.329*"employe" + 0.258*"emiss" + 0.244*"product" + 0.203*"develop" | Sustainable product development | Environmental |

Mercedes-Benz legislation CV:



A8 Audi legislation: topic themes & CV graph

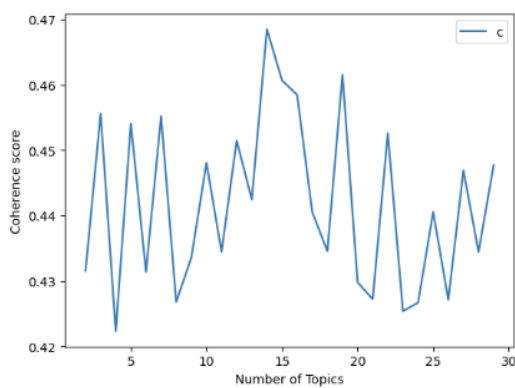
| Audi legislation: topic themes | | | |
|--------------------------------|---|--|---------------|
| Number of topics | Terms | Theme | TBL class |
| 1 | -0.911*"product" + - 0.177*"servic" + - 0.172*"sustain" + - 0.164*"employe" + - 0.090*"emiss" | Carbon emission reduction, sustainable/ fair operating practices | Environmental |
| 2 | -0.589*"employe" + - 0.455*"sustain" + - 0.403*"manag" + | Labor practices | Social |

B.Sc. Thesis – How do companies communicate sustainability: a semantic analysis of German automotive manufacturers

| | | | |
|----|---|--|---------------|
| | 0.314*"product" + - 0.195*"gri" | | |
| 3 | '0.737*"employe" + - 0.581*"sustain" + - 0.180*"manag" + - 0.120*"develop" + - 0.116*"gri" | Labor practices | Social |
| 4 | -0.643*"manag" + 0.497*"sustain" + - 0.461*"gri" + - 0.212*"approach" + 0.175*"employe" | Fair operating practices | Social |
| 5 | '0.528*"electr" + 0.458*"emiss" + 0.410*"combin" + 0.255*"power" + 0.252*"etron" | Car production/ innovation (climate-friendly) | Environmental |
| 6 | -0.837*"gri" + 0.484*"manag" + - 0.102*"standard" + 0.091*"integr" + 0.085*"risk" + 0.084*"approach" | Operating practices/ compliance | Social |
| 7 | '0.925*"develop" + - 0.255*"sustain" + - 0.078*"combin" + - 0.076*"manag" + - 0.073*"employe" | Car production/ innovation (Climate-friendly) | Environmental |
| 8 | -0.689*"integr" + - 0.673*"oper" + 0.141*"manag" + - 0.121*"complianc" + 0.067*"sustain" | Alliances, organizational government | Social |
| 9 | '0.643*"electr" + - 0.581*"emiss" + - 0.203*"gkm" + - 0.171*"nedc" + 0.170*"mobil" | Car production | Economic |
| 10 | '0.426*"strategi" + 0.357*"vehicl" + 0.289*"chain" + 0.277*"busi" + 0.248*"suppli" | Supply chain | Economic |
| 11 | '0.650*"oper" + - 0.600*"integr" + - 0.257*"strategi" + - 0.203*"complianc" + 0.148*"vehicl" | Sales operation/management | Economic |

| | | | |
|----|---|---------------------------------------|----------|
| 12 | -0.754*"strategi" + 0.280*"busi" + - 0.234*"oper" + 0.191*"partner" + 0.183*"vehicl" | Product brand | Economic |
| 13 | '0.571*"busi" + 0.390*"partner" + - 0.343*"vehicl" + 0.223*"strategi" + - 0.216*"chain" | Production/ supply chain operation | Economic |

Audi legislation CV:



A9 Volkswagen legislation: topic themes & CV graph

Volkswagen legislation: topic themes

| Number of topics | Terms | Themes | TBL class |
|------------------|---|---|---------------|
| 1 | '0.835*"manag" + 0.292*"sustain" + 0.260*"risk" + 0.122*"complianc" + 0.100*"busi" | Compliance to environmental targets in business operation | Environmental |
| 2 | '0.747*"sustain" + - 0.460*"manag" + 0.176*"suppli" + 0.174*"chain" + 0.163*"busi" | Environmental action in supply chain management | Environmental |
| 3 | '0.538*"risk" + -0.503 *"sustain" + 0.304 *"busi" + -0.214* "manag" + 0.209*"human" | Environmental action in business operation | Environmental |
| 4 | '0.488*"vehicl" + - 0.339*"risk" + 0.320*" emiss" + 0.256*"car" + 0.242*"commerci" | Car production/ development (climate- friendly) | Environmental |

| | | | |
|---|---|---|------------------------|
| 5 | 0.511*"busi" + -0.401*"risk" + 0.339*"employe" + 0.267*"right" + 0.258*"human" | Integration of stakeholders in environmental actions | Environmental & social |
| 6 | -0.512*"suppli" + -0.497*"chain" + 0.471*"car" + 0.199*"vehicl" + -0.156*"respons"+ 0.125*"car" | Environmental action in supply chain management | Environmental |
| 7 | '0.358*"inform" + 0.296*"public" + 0.277*"contain" + 0.275*"unit" + 0.269*"directli" | Communication & integration of stakeholders and public | Social |
| 8 | '0.756*"green" + 0.268*"financ" + 0.239*"framework" + 0.223*"bond" + 0.179*"elig" | Financial performance | Economic |
| 9 | '0.758*"materi" + 0.452*"raw" + -0.212*"suppli" + -0.203*"chain" + 0.173*"employe" | Raw materials/ Car production/ development (climate-friendly) | Environmental |

A10 BMW legislators: topic themes & CV graph

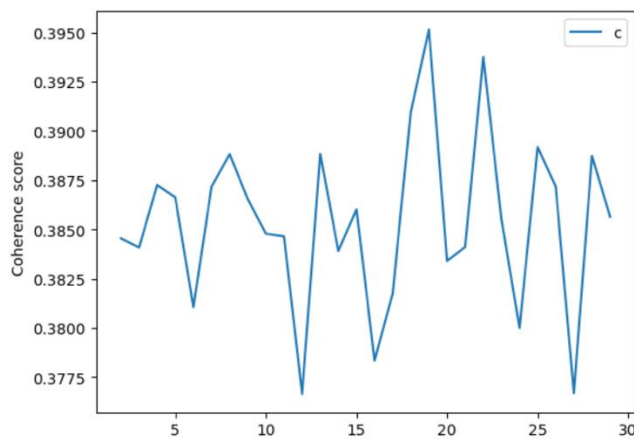
| BMW legislators: topic themes | | | |
|-------------------------------|---|--|---------------|
| | Terms | Theme | TBL class |
| 1 | 0.748*"emiss" + 0.271*"co2" + 0.228*"product" + 0.213*"scope" +0.143*"climat" +0.100*"reduc" | Emission reduction 3in production& supply chain | Environmental |
| 2 | 0.381*"climat" + 0.325*"cdp" + 0.308*"questionnair" + 0.305*"wednesday" + -0.266*"emiss" + -0.089*"co2" | Carbon reduction in production | Environmental |
| 3 | 0.651*"manag" + 0.343*"risk" + 0.340*"product" + -0.289*"emiss" + 0.189*"sustain" | Employee care and stakeholder integration / relationship maintenance | Social |

B.Sc. Thesis – How do companies communicate sustainability: a semantic analysis of German automotive manufacturers

| | | | |
|----|---|--|----------------------------|
| 4 | -0.795*"product" + 0.442*"manag" + - 0.195*"servic" + 0.189*"emiss" + 0.183*"risk" | Renewable resources/ carbon reduction/ conserving of resources/ environment | Environmental |
| 5 | 0.665*"employe" + - 0.288*"risk" + 0.278*"develop" + 0.272*"sustain" + - 0.222*"product" | Employee conditions / people & society | Social |
| 6 | -0.532*"employe" + 0.366*"sustain" + 0.299*"chain" + 0.282*"suppli" + - 0.245*"manag" | Sustainable supply chain strategy | Environmental |
| 7 | -0.546*"risk" + 0.365*"sustain" + 0.360*"manag" + - 0.308*"employe" + - 0.284*"chain" | Sustainable supply chain | Environmental |
| 8 | -0.579*"energi" + 0.447*"sustain" + - 0.253*"electr" + 0.223*"develop" + - 0.210*"vehicl" | Renewable energy, electric cars, | Environmental |
| 9 | 0.451*"chain" + 0.427*"suppli" + - 0.370*"risk" + - 0.278*"vehicl" + | Emission reductions in production & supply chain | Environmental |
| 10 | 0.531*"energi" + -0.295*"vehicl" + 0.202*"sustain" + 0.175*"effici" + 0.164*"renew" | Electric cars/ energy efficient cars → sales | Environmental |
| 11 | 0.620*"2020" + - 0.451*"vehicl" + - 0.258*"electr" + 0.240*"supplier" + 0.216*"gri" | Supply chain of electric. Cars | Economic |
| 12 | 0.627*"co2" + 0.555*"scope" + - 0.300*"target" + 0.166*"energi" + - 0.114*"reduc" | CO2 reduction, hitting target for renewable energy, | Environmental |
| 13 | -0.581*"gri" + - 0.417*"supplier" + - 0.193*"brilliant" + 0.152*"target" + - 0.135*"vehicl" | Conforming to GRI regulations and meeting climate targets | Economic/ Environmental |

| | | | |
|----|--|--|----------------------------|
| 14 | 0.535*"und" + - 0.491*"target" + - 0.449*"der" + - 0.218*"gri" + 0.194*"supplier" + | Reporting and disclosing environmental actions | Environmental |
| 15 | 0.535*"und" + - 0.491*"target" + - 0.449*"der" + - 0.218*"gri" + 0.137*"brilliant" | Conforming to GRI regulations and meeting climate targets | Economic/ Environmental |
| 16 | -0.466*"target" + - 0.419*"supplier" + 0.373*"gri" + - 0.253*"brilliant" + - 0.245*"scope" | Targets for supply chain concerning carbon emission and energy | Environmental |
| 17 | 0.671*"die" + - 0.497*"der" + - 0.430*"brilliant" + - 0.187*"und" + 0.080*"supplier" | Compliance to environmental actions/ regulations | Environmental |

BMW legislation CV:



A11 Mercedes-Benz consumers: topic themes

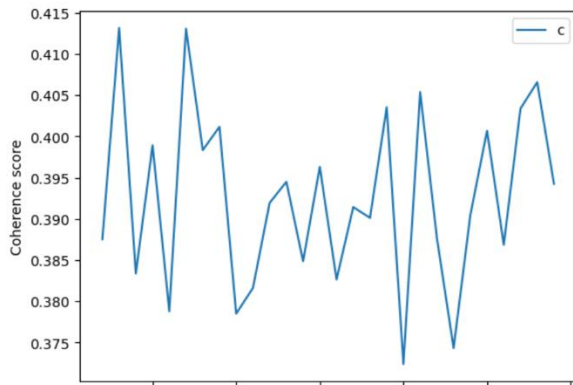
Mercedes-Benz consumers: topic themes

| Number of topics | Terms | US consumers | TBL class | UK consumers | TBL class |
|------------------|--|-----------------------------|-----------|---|------------------|
| | | Themes | | Term | |
| 1 | 0.954*"http" + 0.155*"mbphotopass" + 0.060*"gle" + | Promotion/ advertisement | Economic | 0.371*"team" + 0.337* "servic" + 0.308* "custom" | Customer service |

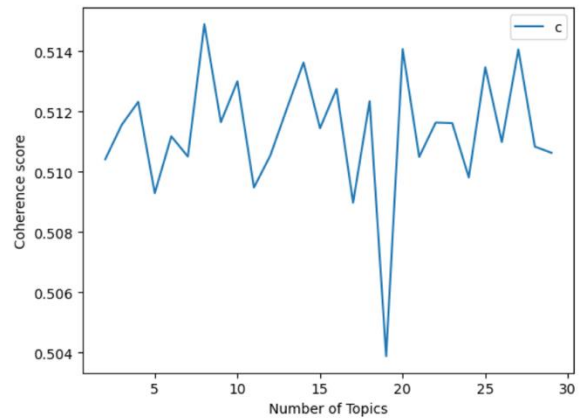
B.Sc. Thesis – How do companies communicate sustainability: a semantic analysis of German automotive manufacturers

| | | | | | | |
|----------|---|---------------------------------------|--------|---|---------------------|--------|
| | 0.058*"sclass" + 0.051*"glc" | | | + 0.289*"sorri" + 0.272*"pleas" | | |
| 2 | 0.592*"mbphotopass" + -0.569*"eq" + - 0.351*"mercedeseq" + -0.177*"allelectr" + -0.136*"allnew" | Customer service | Social | -0.798*"http" + -0.253* "retail" + 0.195*"team" + 0.193*"servic" + 0.183* "custom" | Customer service | Social |
| 3 | 0.592*"mbphotopass" + -0.569*"eq" + - 0.351*"mercedeseq" + -0.177*"allelectr" + -0.136*"allnew" | Promotion/New mode introduction | | '0.419*"http" + -0.390*" pleas" + -0.344*"send" + 0.298*"team" + -0.285* "contact" | Customer service | Social |
| 4 | | | | '0.632*"thank" + -0.460 *"sorri" + -0.383*"hear" + 0.265*"youmercedesbenzuek" + -0.146*"contact" | Customer service | Social |
| 5 | | | | '0.460*"sorri" + 0.383 *"thank" + 0.351*"hear" + - 0.265*"custom" - 0.264 *"servic | Customer service | Social |
| 6 | | | | '0.548*"retail" + -0.329 *"http" + 0.326*"contact" + -0.267*"send" + -0.211*. "email" | Customer service | Social |
| 7 | | | | '0.453*"team" + -0.410 *"servic" + -0.349* "custom" + -0.270*" thank" + 0.240*"email" | Customer service | Social |
| 8 | | | | -0.380*"retail" + 0.359*"team" + - 0.343*"email" + 0.252*"pleas" + - 0.239*"reach" | Customer service | Social |

Mercedes-Benz US consumers:



Mercedes-Benz UK consumers:

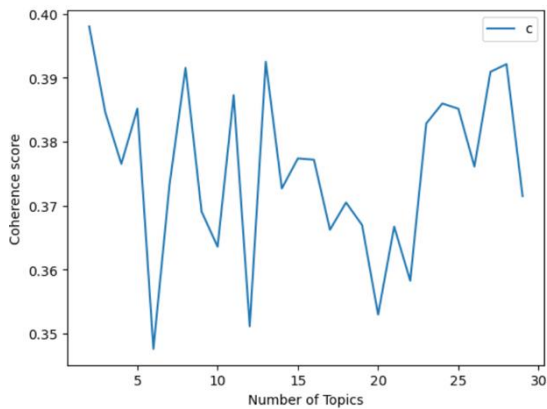


A12 Audi consumers: topic themes & CV graph

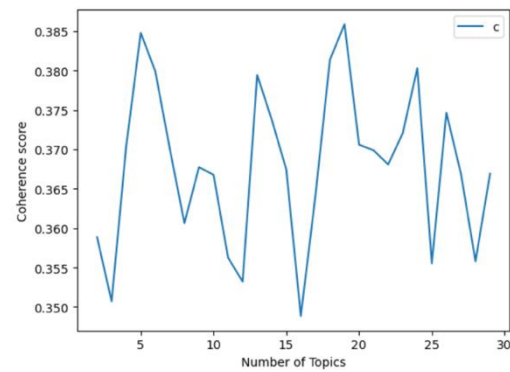
Audi consumers: topic themes

| Number of topics | US consumers | | | UK consumers | | |
|------------------|---|------------------|-----------|---|------------------|-----------|
| | Terms | Theme | TBL class | Terms | Theme | TBL class |
| 1 | 0, '0.411*"pleas" + 0.323 *"detail" + 0.304*"experi" + 0.298*"conveni" + 0.292 *"inform" | Customer service | Social | 0, '0.405*"hear" + 0.393*"look" + 0.340*"pleas" + 0.321*"detail" + 0.296*"sorri" | Customer service | Social |
| 2 | '0.728*"http" + 0.358 *"tcowtwucmwwaudi" + -0.206*"could" + 0.178*"thank" + 0.177 *"assist" | Customer service | Social | '0.653*"http" + 0.241*"good" + 0.240*"pleas" + 0.219*"thank" + -0.193*"look" | Customer service | Social |
| 3 | | | | '0.607*"http" + -0.431*"thank" + -0.288*"pleas" + 0.162*"look" + -0.157*"assist" | Customer service | Social |
| 4 | | | | 0.233*"assist" + 0.201*"good" + -0.181*"disappoint" + 0.175*"vin" + 0.174*"happi" | Customer service | Social |
| 5 | | | | '0.502*"good" + 0.284*"look" + -0.257*"happi" + -0.227*"team" + -0.220*"centr" | Customer service | Social |

Audi US consumers:



Audi UK consumers:



A13 Volkswagen consumers: topic themes & CV graph

Volkswagen consumers: topic themes

| Number of topics | US consumers | | | UK consumers | | |
|------------------|--|--|---------------|--|------------------|-----------|
| | Terms | Theme | TBL class | Terms | Theme | TBL class |
| 1 | 0.953*"http" + - 0.100*"sale" + - 0.091*"vwoa" + - 0.077*"suv" + - 0.060*"unit" + | Promotion | Economic | '0.367*"pleas" + 0.361 *"hear" + 0.315*"http" + 0.309 *"thank" + 0.283 *"disappoint" | Customer service | Social |
| 2 | 0.715*"sale" + - 0.383*"unit" + - 0.321*"suv" + - 0.315*"vwoa" + - 0.193*"brand" | Business performance | Economic | .513*"http" + 0.439*"thank" + - 0.340*"hear" + -0.313 *"disappoint" + -0.211 *"thanksukvolkswagen" | Customer service | Social |
| 3 | 0.507*"amp" + 0.267*"vwoa" + 0.239*"mobil" + 0.196*"fatur" + 0.192*"electr" | Environmental innovations to car model | Environmental | -0.407*"retail" + - 0.343* "team" + 0.312*"look" + 0.277*"detail" + -0.217 *"advis" | Customer service | Social |
| 4 | 0.399*"amp" + - 0.362*"electr" + 0.310*"jetta" + - 0.290*"mobil" + - 0.241*"fatur" | Environmental innovations to car model | Environmental | -0.518*"pleas" + 0.355* "retail" + -0.304*"team" + 0.279*"hear" + 0.262* "disappoint" | Customer service | Social |
| 5 | 0.421*"concept" + 0.334*"tao" + - 0.331*"amp" + 0.315*"suv" + | Product promotion | Economic | '0.502*"good" + 0.284* "look" + -0.257*"happi" + -0.227* "team" + - 0.220* "centr" | Customer service | Social |

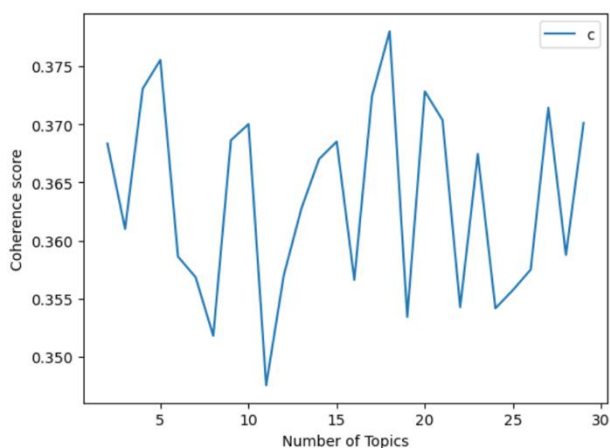
B.Sc. Thesis – How do companies communicate sustainability: a semantic analysis of German automotive manufacturers

| | | | | | | |
|----|--|---|----------|--|---------------------|--------|
| | 0.276*"atla" + 0.191*"basecamp" | | | | | |
| 6 | -0.297*"concept" + + 0.274*"name" + -0.270*"vwoa" + 0.264*"jetta" + 0.242*"best" | Brand promotion | Economic | '0.375*"retail" + - 0.315*"hope" + 0.289*"http" + 0.288 *"thanksukvolkswagen" + -0.288*"get" | Customer service | Social |
| 7 | -0.576*"design" + -0.213*"product" + + 0.186*"futur" + -0.182*"tao" + 0.179*"atla" + | Product promotion | Economic | -0.412*"hope" + - 0.373* "look" + - 0.249*"detail" + 0.245*"thank" + - 0.222* "helpsukvolkswagen" | Customer service | Social |
| 8 | '0.400*"name" + - 0.320*"jetta" + - 0.235*"gli" + 0.228*"best" + - 0.210*"look" | Product promotion | Economic | -0.440*"thank" + 0.420*"hope" + 0.223* "helpsukvolkswagen" + 0.217*"thanksukvolksw agen" + -0.197*"team" | Customer service | Social |
| 9 | -0.353*"vwoa" + 0.313*"amp" + - 0.294*"golf" + 0.204*"suv" + - 0.165*"technolog" | Product promotion | Economic | -0.436*"assist" + 0.258*" ukvolkswagen" + -0.220 *"contact" + 0.201*"team" + 0.197*"concern" | Customer service | Social |
| 10 | '0.298*"dustin" + -0.298*"concept" + + 0.281*"tod" + 0.273*"journey" + 0.238*"cross" + - 0.221*"golf" | Product promotion | Economic | -0.432*"pleas" + 0.330* "team" + 0.312* "thanksukvolkswagen" + -0.311*"retail" + 0.227* "updat" | Customer service | Social |
| 11 | '0.407*"world" + - 0.268*"vwoa" + - 0.257*"jetta" + - 0.254*"technolog" + 0.175*"golf" | Product promotion | Economic | 0.401*"contact" + 0.355* "detail" + 0.350*"servic" + - 0.287*"advic" + 0.253* "custom" | Customer service | Social |
| 12 | -0.321*"product" + + -0.279*"test" + - 0.226*"safeti" + - 0.186*"golf" + - 0.185*"atla" | Product promotion | Economic | '0.583*"contact" + - 0.270* "thanksukvolkswagen" + 0.225* "hear" + - 0.187*"rais" + - 0.185*"get" | Customer service | Social |
| 13 | '0.391*"world" + - 0.356*"golf" + - 0.219*"design" + 0.183*"celebr" + 0.182*"vwgoa" | Workshops, educational training programs | Social | -0.512*"assist" + 0.340*"get" + - 0.249*"updat" + - 0.249* "ukvolkswagen" + 0.220* "touch" | Customer service | Social |
| 14 | -0.344*"electr" + 0.260*"design" + 0.249*"futur" + 0.227*"atla" + - 0.194*"suv" | Product promotion | Economic | '0.352*"thank" + - 0.341* "ukvolkswagen" + -0.298* "get" + 0.256* | Customer service | Social |

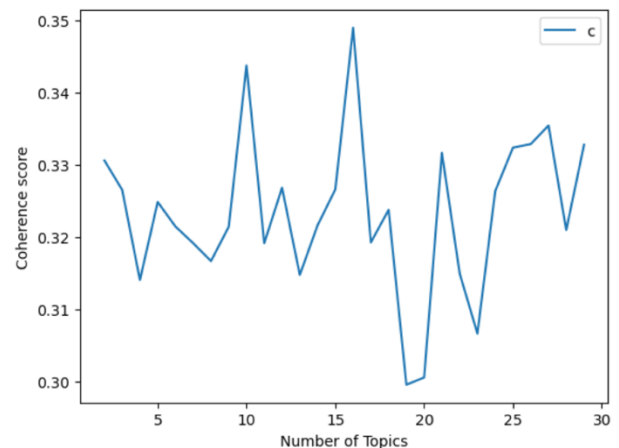
B.Sc. Thesis – How do companies communicate sustainability: a semantic analysis of German automotive manufacturers

| | | | | | | |
|-----------|---|--|---------------|---|---------------------|--------|
| | | | | "helpsukvolkswagen" + -0.253*"http" | | |
| 15 | -0.310*"join" + - 0.306*"design" + 0.266*"read" + 0.234*"product" + 0.210*"engin" | Alliances and integration of different actors in research & development | Social | -0.383*"detail" + 0.329* "help" + 0.285*"great" + - 0.252*"get" + 0.249 *"thanksukvolkswagen" | Customer service | Social |
| 16 | -0.301*"drive" + 0.239*"read" + - 0.188*"product" + 0.179*"futur" + 0.177*"engin" + - | Product promotion | Economic | -0.486*"detail" + - 0.410* "great" + 0.346*"inform" + - 0.202*"welcom"+ 0.188* "contact" | Customer service | Social |
| 17 | 0.330*"read" + 0.273*"concept" + -0.255*"suv" + 0.176*"safeti" + - 0.174*"atla" | Product promotion | Economic | | | |
| 18 | -0.280*" technolog" + 0.239*"jetta" + 0.236*"product" + 0.188*"vwoa" + - 0.188*"suv" | Environmental innovations to car model | Environmental | | | |

Volkswagen US consumers:



Volkswagen UK consumers:



A14 BMW consumers: topic themes & CV graph

| BMW consumers: topic themes | | | | | | |
|-----------------------------|--|-------------------|-----------|--|------------------|-----------|
| US consumers | | | | UK consumers | | |
| Number of topics | Terms | Theme | TBL class | Terms | Theme | TBL class |
| 1 | '0.551*"pleas" + 0.426*"http" + 0.301*"vin" + 0.284*"phone" + 0.264*"learn" | Customer service | Social | '0.464*"thanksbmw_uk" + 0.367*"pleas" + 0.342*"sorri" + 0.301*"hear" + 0.277*"vin" | Customer service | Social |
| 2 | -0.863*"http" + 0.291*"pleas" + 0.144*"vin" + 0.141*"phone" + 0.111*"amp" | Customer service | Social | -0.734*"http" + -0.266*"find" + 0.220*"vin" + 0.205*"pleas" + 0.164*"sorri" | Customer service | Social |
| 3 | 0.458*"team" + 0.390*"custom" + -0.336*"vin" + 0.331*"call" + -0.317*"phone" | Customer service | Social | 0.466*"http" + -0.316*"happi" + -0.315*"team" + -0.294*"thanksbmw_uk" + 0.275*"pleas" | Customer service | Social |
| 4 | 0.458*"team" + 0.390*"custom" + -0.336*"vin" + 0.331*"call" + -0.317*"phone" | Customer service | Social | -0.464*"thanksbmw_uk" + 0.325*"look" + -0.317*"pleas" + 0.298*"happi" + 0.285*"hear" | Customer service | Social |
| 5 | -0.606*"sorri" + -0.318*"hear" + -0.282*"learn" + -0.242*"enjoy" + -0.241*"frustrat" | Customer service | Social | 0.709*"centr" + -0.360*"look" + -0.214*"thank" + 0.193*"help" + 0.154*"involv" | Customer service | Social |
| 6 | -0.484*"enjoy" + -0.402*"look" + 0.282*"servic" + -0.248*"great" + -0.241*"thank" | Brand promotion | Economic | -0.476*"look" + 0.432*"help" + -0.373*"centr" + 0.312*"hear" + 0.298*"sorri" | Customer service | Social |
| 7 | '0.452*"servic" + -0.373*"pleas" + 0.283*"enjoy" + 0.268*"amp" + -0.255*"look" | Product promotion | Economic | 0.473*"help" + 0.415*"happi" + -0.328*"sorri" + -0.286*"thanksbmw_uk" + 0.262*"info" + | Customer service | Social |
| 8 | '0.587*"look" + -0.296*"call" + -0.279*"enjoy" + 0.259*"team" + 0.249*"sorri" | Customer service | Social | -0.436*"thanksbmw_uk" + 0.377*"pleas" + -0.306*"happi" + 0.293*"hear" + 0.266*"team" | Customer service | Social |
| 9 | -0.315*"look" + -0.268*"call" + - | Customer service | Social | -0.420*"get" + -0.357*"thank" + 0.318*"pleas" | Customer service | Social |

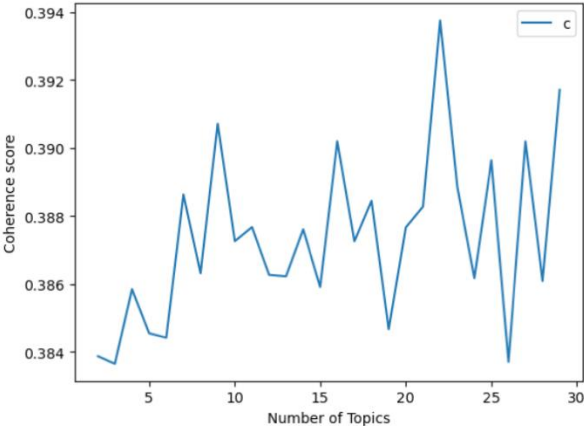
B.Sc. Thesis – How do companies communicate sustainability: a semantic analysis of German automotive manufacturers

| | | | | | | |
|----|--|------------------|----------|---|---------------------|--------|
| | 0.255*"relat" + 0.250*"enjoy" + 0.244*"pleas" | | | + -0.309*"touch" + 0.211*"detail" | | |
| 10 | '0.417*"team" + 0.328*"hear" + - 0.323*"call" + - 0.314*"thank" + - 0.312*"learn" | Customer service | Social | 0.455*"hear" + 0.430* "happi" + -0.213*"team" + 0.203*"receiv" + 0.193* "great" | Customer service | Social |
| 11 | -0.396*"avail" + - 0.331*"thank" + 0.302*"look" + - 0.241*"vehicl" + 0.227*"learn" | Customer service | Social | -0.398*"get" + 0.300* "help" + 0.296*"look" + - 0.256*"happi" + 0.242* "find" | Customer service | Social |
| 12 | 0.507*"thank" + 0.324*"learn" + - 0.269*"sorri" + - 0.253*"enjoy" + 0.233*"experi" | Customer service | Social | -0.381*"servic" + -0.303* "detail" + -0.281*"contact" + 0.256*"centr" + 0.241* "receiv" | Customer service | Social |
| 13 | '0.404*"avail" + - 0.360*"thank" + 0.289*"learn" + - 0.265*"hear" + 0.236*" vehicl" | Customer service | Social | '0.678*"info" + -0.504* "inform" + -0.220*"happi" + -0.176*"help" + 0.149* "detail" | Customer service | Social |
| 14 | 0.437*"bmwmoto rsport" + 0.397* "bmwgroup" + 0.288*"great" + - 0.287*"enjoy" + - 0.202*"thank" | Customer service | Social | '0.598*"servic" + 0.277* "thank" + 0.256*"vin" + 0.233*"receiv" + -0.222* "pleas" | Customer service | Social |
| 15 | 0.579*"drive" + 0.466*"ultim" + 0.219*"experi" + -0.172*"relat" + - 0.160*"bmwmoto rsport" | Promotion | Economic | -0.439*"find" + -0.400* "detail" + -0.245*"sorri" + 0.231*"team" + -0.215* "get" | Customer service | Social |
| 16 | 0.408*"brake" + - 0.356*"hear" + 0.266*"thank" + - 0.194*"care" + 0.171*"build" | Customer service | Social | -0.486*"detail" + -0.410* "great" + 0.346*"inform" + -0.202*"welcom" + 0.188 * "contact" | Customer service | Social |
| 17 | -0.301* "bmwgroup" + - 0.275* "bmwmotorsport" + 0.255*"call" + - 0.251*"experi" + 0.230*"hear" | Customer service | Social | -0.416*"thank" + -0.385* "sorri" + 0.220*"vin" + 0.212*"get" + 0.204* "disappoint" | Customer service | Social |
| 18 | -0.371*"brake" + -0.244*"great" + 0.207*"call" + - | Customer service | Social | -0.316*"recommend" + 0.291*"vin" + 0.253* | Customer service | Social |

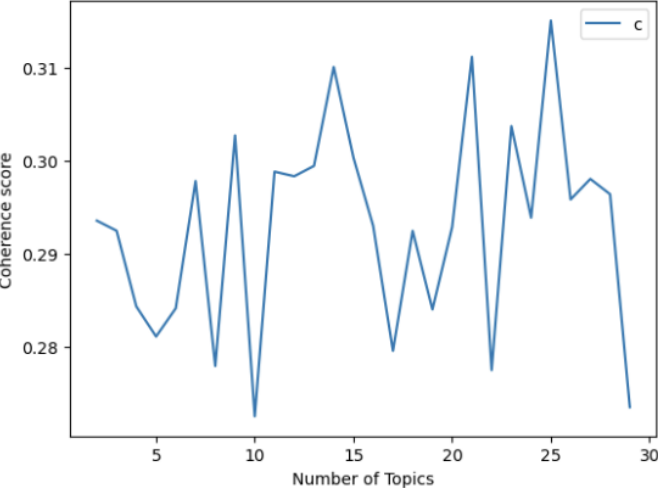
B.Sc. Thesis – How do companies communicate sustainability: a semantic analysis of German automotive manufacturers

| | | | | | | |
|----|---|------------------|----------|--|---------------------|--------|
| | 0.185*"hear" + - 0.184*"directli" | | | "team" + 0.246*"find" + - 0.237*"stay" | | |
| 19 | -0.493*"assist" + -0.362*"great" + - 0.267*"contact" + 0.164*"detail" + 0.156*"care" | Customer service | Social | '0.405*"contact" + 0.357 *"best" + -0.325*"anyth" + 0.260*"look" + 0.250* "help" | Customer service | Social |
| 20 | -0.354*"send" + - 0.342*" great" + - 0.256*"detail" + - 0.219* "bmwusacaresbm wusacom" + - 0.218*"custom" | Customer service | Social | '0.549*"best" + 0.297* "seri" + -0.273* "recommend" + - 0.219*"contact" + 0.187*"servic" | Customer service | Social |
| 21 | -0.479*"great" + 0.263*"assist" + 0.257*"brake" + 0.204*"learn" + 0.202*"experi" | Promotion | Economic | '0.323*"contact" + 0.313* "find" + -0.261* "best" + - 0.233*"hear" + 0.228* "stay" | Customer service | Social |
| 22 | '-0.526*"love" + - 0.281*"get" + - 0.249*"itbmwusa " + 0.228*"experi" + -0.228*"go" | Promotion | Economic | -0.344*"anyth" + -0.338 *"contact" + 0.290*"hope" + -0.226*"know" + -0.212 *"let" | Customer service | Social |
| 23 | '0.304*"coup" + 0.289*"seri" + 0.211*"assist" + 0.206*"love" + - 0.190*"avail" | Promotion | Economic | -0.390*"seri" + 0.388* happen" + 0.263*"inform" + -0.258*"recommend" + - 0.245*"vin" | Customer service | Social |
| 24 | | | | '0.588*"seri" + 0.285* "inform" + -0.247*"vin" + -0.178*"stay" + 0.173 *"littl" | Customer service | Social |
| 25 | | | | '0.314*"recommend" + - 0.254 *"team" + 0.220 *"happen" + -0.215 *"know" + 0.204*"thank" -0.563*"know" + -0.436* "let" + 0.309*"anyth" + 0.228*"feel" + 0.204* "way" | Customer service | Social |
| 26 | | | | -0.563*"know" + 0.436* "let" + 0.309* "anyth" + 0.228* "feel" + 0.204* "way" | Customer service | Social |

BMW US consumers:



BMW UK consumers:



A15 Digital appendix

Link to digital appendix:

<https://syncandshare.lrz.de/getlink/fiLfGnuX5RLbbrCwxEkCeJ/>