

SENTIMENT ANALYSIS OF 10-K REPORTS USING TERM FREQUENCY COMPARATIVE APPROACH: A PRELIMINARY STUDY.

Felicia Tay Sue Ching¹ and Tan Chye Cheah²

¹*Asia Pacific University of Technology and Innovation, Malaysia*

Abstract. Monetary 10K reviews consist of helpful info with regard to visitors to aid choice within expense. Because of the wealthy content material associated with 10K information, this is a really tiresome job to undergo the 10K are accountable to discover required details with regard to evaluation plus investment decision. The objective of this particular research would be to create a way regarding examining the particular emotions inside 10-K reviews, via assessment associated with phrase rate of recurrence (TF). Within Phase one execution, the primary function includes carrying out the test utilizing the current strategy associated with evaluating a listing of emotion conditions contrary to the conditions included inside the 10-K statement, also called typically the “Bag associated with Words” technique. The 2nd phase regarding execution is to create phrase eq from the group of 2 10-K reviews, to ensure that TF evaluation can be carried out upon both of these studies. Period one implies that there can be misunderstandings in case belief ratings were to become examined in encounter worth. It is because the particular ratings failed to reveal a definite partnership around the overall performance from the companies analysed. Level two pointed out that this comparison strategy allows typically the décrit from the are accountable to realize 12 months about 12 months modifications much better, since the TF variations in many cases are a sign involving modifications inside business instructions or even functional choices in the past year. This particular research plays a role in present books in the supporting technique associated with examining the particular 10-K record, that make utilization of relative expression eq and offers a good setup arrange for experts in addition to traders via procedure for drill down into the particular 10-K textual content.

Key phrases: Textual content Evaluation, Phrase Rate of recurrence, 10-K, Emotion Evaluation, Economic Statement Research.

Keywords: Key phrases: Textual content Evaluation, Phrase Rate of recurrence, 10K, Emotion Evaluation, Economic Statement Research

INTRODUCTION

10-k reviews are an origin info to achieve experts plus buyers that search for keywords to retrieve content associated with a new stated company in america (loughran plus mcdonald, 2016). the particular 10-k statement offers their significance, particularly when it can be needed simply by government bodies hence which makes it some sort of certification associated with conformity. think about the taxes gain, the info equipped has to be correct, or maybe legal activity could be used contrary to the taxpayer. the particular 10-k record includes both monetary in addition to nonfinancial shows of any organization, which include company dangers, functioning and even monetary benefits, management's viewpoint about enterprise outcomes together with organization motorists, marketplace dangers plus disclosures, lawful procedures and company governance most important ones (sec. gov, 2011). though companies possess the flexibility associated with choosing creativeness within stringing text to help make the 10-k review seems better, the particular create belonging to the textual content can not be altered in order to confront some of the economic outcomes plus procedure. Consequently, you can find research that have connected salaries adjustment aided by the elevated intricacy within the survey (lo, ramos in addition to falò, 2017). This means that, whenever income worsens, the particular document blogger will not really want the info to become hence noticeable towards the visitors. even though this particular place will never be discovered with this analysis, the truth that companies would like to proceed further for making the particular article more complicated (ie. to cover undesirable news), is certainly evidence thatthis 10-k has got the benefit to be able to justify these kinds of energy.

within examining typically the framework for the 10-k statement, the space and even subjects regarding disclosure within each one of the parts of the particular 10-k symbolizes a big difficult task of visitors from the state. it really is contended that will in ways, this specific task will be the exact same in additional areas throughout poems, media, past files, together with

educational publications, where huge amounts associated with text message or even an is simply too very much for any accomplish overview within a minimal timeframe (dyer, lang plus stice-lawrence, 2017). timeliness is really a fundamental aspect in examining the particular 10-k record, where the organization might take a00 downwards style ultimately causing personal bankruptcy, or perhaps there could be a few incidents which usually lead to a company combination or even good discounts. nevertheless , when it comes to economical metrics, that is readily obtainable within revenue ads, several buyers are getting to be disappointed using the reducing capability of economic details in order to replicate the actual overall performance involving companies in addition to calculate long term dividends (lee, 2018). Typically the decrease in importance of economic info is really because they might not really website link the near future occasions in the company towards the profits statistics which were simply being shared. this particular move within requirement in between volumes plus info has a few prospective buyers when considering textual content research and even textual content exploration, where the particular expert could obtain certain beneficial info from your text message associated with company records such as the 10-k studies.

there has been lots of spots protected inside 10-k textual content examination, plus the problem assertion involve troubles because of the complication from the file, which often include not merely statistical economic outcomes, but in addition several sentences associated with phrases which in turn express the particular missions, technique plus fiscal hazards experienced with a stated company within a monetary 12 months (dyer, lang plus stice-lawrence, 2017). when a good expert would be to look into the present year's 10-k account, checking for facts plus intuiting experience through the sentences, the job gets challenging together with time intensive. ways of examining 10-k emotions are restricted, which often is lacking in the competitive ways to uncover information inside business greetings. Because of the problems throughout textual content evaluation, it is actually difficult to discover significant monetary shades via applying emotion wordlists to be able to evaluate typically the efficiency of the provider according to the 10-k records. it is because looking at the 10-k assertion, which can be solely a new introduction associated with monochrome text message plus game tables, appears to light when compared with browsing the site regarding monetary information by using appealing headers plus advertisements. however, 12-monthly review, that is not within the 10-k

file format, includes an a lot more brilliant predisposition, which will happens to be a much better learn when compared to 10-k record (zeller ainsi que ing., 2012).

the importance on this analysis is within taking a look at precisely how textual content evaluation involving 10-k emotions may be carried out, and exactly how it really is enhanced by means of extra overview over the name eq attained within just person 10-k accounts (MM Kamruzzaman et. al 2022). The explanation associated with studying business feelings by having a comprehensive tf assessment would be to allow the particular id regarding subdued thoughts that may be analysed additional to include onto the knowing in addition to research of the organization. To examine the particular minuscule rather than macro might appear such as ineffective efforts with regard to legal figures which usually have to supervise 1000s of businesses. However with the person expert or perhaps trader, more advanced of which their own choice includes a number of enterprises, whether it's determining to get in order to evaluate competitors. Pertaining to this kind of people, the general belief ratings will never be adequate to get a good enough verification or even solutions around the firm involved. consequently , further datan is required regarding choice manufacturers in order to verify their particular activities. Homework goals of the analysis consist of thinking about exactly how 10-k describe statements happen to be analysed within earlier literatures, along with the particular abilities and failings with the strategies appointed. this specific research furthermore strives to learn the significance of word rate of recurrence evaluation by providing extra important remarks within the company's potential future path and even surgical treatments.

SENTIMENT ANALYSIS OF 10-K REPORT

Emotion evaluation or even viewpoint exploration is really a research associated with removing, obtaining plus classifying viewpoint in addition to expression included inside commentaries, files, reviews and even claims (Ravi together with Ravi, 2015). To access the main from the emotion, it is very important in order to 1st filter any kind of natural or even feedback that have no emotions (Chaturvedi ainsi que ing., 2018). Consequently , numerous literatures possess centered on categorizing views in to good plus unfavorable for that related stakeholders to help make the correct choice (Shayaa ou 's., 2018). These types of styles also have affected the particular research associated with monetary textual content, that has probably the

most importance in order to traders plus experts, that requirements info to judge expense choices (Chan in addition to Chong, 2017). There are numerous strategies which have been discovered simply by experts up to now in regards to text message examination, including steps within legibility, book dependent, along with other device studying methods such as Naïve Bayes, Assistance Vector Devices, Semantic Evaluation plus Nerve organs System (Guo, Shi and even Su, 2016). Desk one displays an index of the various groups inside associated with textual content exploration strategies utilized in regards to the particular 10-K statement.

Li (2010) analysed the particular strengthen associated with 10-K contents along with other monetary claims, utilizing a Naïve Bayesian formula, via by hand categorizing thirty, 500 phrases taken out from your MDA portion of the particular 10-K reviews in to good plus unfavorable emotions (Li, 2010). Out of this function, it really is discovered that will companies along with much better shows generally includes a better sculpt within their MDA assertions. Making use of typically the MDA part of the particular 10-K statement, Cecchini ainsi que ing. (2010) a new group of dictionaries to tell apart deceptive through non-fraudulent companies and also broke through nonbankrupt companies. This particular function brings together each quantitative information plus textual content info, displaying that this MDA area includes supporting info that will within examining 10-K reviews (Cecchini ou ing., 2010).

Campbell ain 's. (2010) identified that will businesses possess seemed to be offering useful danger element disclosures within their 10-K information where their own outcomes display the disclosures within the danger area correlates favorably in order to post-disclosure business dangers. Their own strategy regarding removing terms associated with economic, lawsuit plus taxes hazards aspects entails an application together with organic vocabulary digesting mak-

ing use of Valuable Dirichlet Allowance (LDA), that is a generative record design within subject modeling (Campbell tout autant que 's., 2010). Huang in addition to Li (2011) suggested the multilabel text message category K-nearest neighbors formula to categorise twenty five chance elements from your Product 1A – Danger Aspects from the 10-K statement. The particular writers recognized that this some weakness of the technique is that just coaching information which are much like their particular check information are utilized for computation from the specific likeness (Huang and even Li, 2011).

Loughran together with McDonald (2011) a new number of emotion wordlists, where their very own primary factor is a listing of unfavorable phrases of which express bad shades inside a monetary feeling, such as: criminal offence, a lawsuit, restated, misstatement, unexpected. Aside from the damaging wordlist, these people produced five some other listings: optimistic, doubt, litigious, solid modal plus poor modal. Using their research, they will

announced how the MDA portion of typically the 10-K record, which usually numerous experts have got centered on, will not produce considerable monetary hues (Loughran in addition to Mcdonald, 2011). These people centered on the usage of the particular “bag associated with words” solution to parse typically the 10-K reviews directly into term vectors. Rawal et. al (2021), Poongodi M et. al(2022), Poongodi M et. al (2021), Ramesh TR et.al (2022), Ahila A et.al (2022), Muniyappan et. al(2022) , Y. Shi et. al (2020), Guobin Chen et.al (2020), Yuanjin Xu et. al (2021), Ding Li et. al (2021) , Bin Yuan et. al (2021), Chi Z et. al (2021).

Mayew, Sethuraman plus Venkatachalam (2014) used Linguistic Query plus Term Count number (LIWC) software program to be able to gauge the part of beneficial plus adverse words and phrases within the MDA part of the particular 10-K review, using the particular book produced by Loughran and even McDonald (2011). Off their results, these people figured the particular MDA segment performs a component within the conjecture of whether or not the company offers heading issue problems (Mayew, Sethuraman together with Venkatachalam, 2014). Liu plus Moffitt (2016) used typically the belief wordlists involving sturdy technique plus fragile technique produced by Loughran plus McDonald (2011) in order to filtration system content that have the particular conditions inside SECURITIES AND

EXCHANGE COMMISSION’S remark characters. The particular creators look for in order to gauge the regarding typically the develop from the SECURITIES AND EXCHANGE COMMISSION’S opinion words with regards to 10-K reviews, and exactly how this particular strength impacts the particular possibility associated with restatement from the 10-K survey (Liu in addition to Moffitt, 2016).

Hájek (2017) produced utilized of the common book called Diction seven. zero as well as the wordlist simply by

Loughran and even McDonald (2011), combined with handbag associated with thoughts approach to forecast irregular share earnings. The outcomes pointed out the recom-

mended technique produces an identical end result towards the Naïve Bayes plus do much better than additional device studying methods (Hájek, 2017). Kang, Recreation area, together with Ryan (2018) looked into affects regarding statements inside the 10-K document which could determine around the present overall performance plus income perseverance from the company. They will used the particular LIWC application in order to determine a built-in emotion rating, which often include good report plus harmful credit score (Kang, Playground in addition to Ryan, 2018). That they discovered that will organizations along with constructive comments usually include much better revenue in the past year. These people recognized the fact that 10-K statement is an intricate go through and the strategy offers firms having a method to self-evaluate their own economic colors (Kang, Area and even Ryan, 2018).

METHODS

Sample was depending on businesses classified by the united states on the arbitrary foundation. Assessment was carried out among two years (for instance, 2016 versus 2017 or even 2018 versus 2019). The primary foundation was 12 months upon yr schedule on a single company in order to emotion terms plus phrase eq. To enhance knowledge of present strategies utilized, an additional choice of examples were utilized to execute a screening associated with emotional rating era making use of all the emotion term listings produced by Loughran in addition to McDonald (2011), including some other emotions wordlist regarding constraining, litigious, good, unfavorable, solid modal plus poor modal. The particular reviews chosen had been through season 2015 in order to 2018.

You will find 2 phases associated with execution with this research since the 1st phase was to check current techniques recommended simply by current literatures (Y. Shi et. al 2020) . This particular very first phase is essential to supply the particular knowledge of recent is strategies function, along with arranged the bottom with regard to Phase two, which usually expects to research the tiny see from the 10-K statement evaluation via a comparison of expression eq. The particular primary strategies within information preprocessing had been exactly the same regarding each phases where transformation associated with PDF FILE to be able to textual content and even cleaning actions were exactly the same, even though information picked had been various. Each levels begin to display obvious variations in the information

change phase, where the particular Phase one produces the belief rating, whilst Period two produces a new TF assessment. The outcomes showing how the information has been changed in these types of phases result in diverse pathways involving design meaning.

Within Level one setup, the primary function includes carrying out the test utilizing the present strategy associated with evaluating a listing of feeling conditions contrary to the conditions included inside the 10-K record, also called typically the “Bag associated with Words” technique. This technique recommends the particular breaking in the textual content in to person phrases or even phrases, that will after that become compared to an additional listing of specified wordlists, be it an optimistic wordlist or perhaps unfavorable wordlist (Loughran together with Mcdonald, 2011). Out of this coordinating procedure, some sort of belief rating has been produced, that is roughly the same as the number of terms are usually compared to typically the opinion wordlist. Consequently , in case there are a great number of optimistic words and phrases matched up, in comparison to bad terms, it has been said that this verse with the statement is inside a good strengthen. The 2nd period associated with execution has been to create phrase eq from the group of a couple of 10-K information, to ensure that TF research can be carried out upon both of these studies.

RESULTS AND DISCUSSION

RESULTS EVALUATION OF STAGE 1 IMPLEMENTATION

Phase one Execution will certainly arranged the backdrop associated with the reason why Phase two Execution is required, that was produced just following the belief associated with the actual Period just one outcomes can offer when it comes to 10-K statement evaluation. The particular computation associated with emotion ratings is a proven

technique, because proved from the numerous belief term listings created plus utilized by an array of experts. Nevertheless , within the evaluation of the 10-K record, frequently additional information are essential. The info might be by means of the way the organization will be working, where it really is going, or even exactly how particular legal guidelines offers impacted the particular company's procedures.

For instance , Determine a single implies that Symantec a new higher litigious rating plus unfavorable ratings

within 2016, however the ratings decreased significantly within 2017. Exactly the same applies to Traditional western Electronic that has higher bad plus litigious results within 2016 when compared to remaining many years. These types of ratings demonstrate number portrayal from the emotion in the company (Guobin Chen et. al 2020). Nevertheless , they cannot appear to express more information. A good expert will have to evaluate additional in regards to what lengthen this kind of ratings are usually legitimate, in addition to any more info could be produced from the particular ratings.

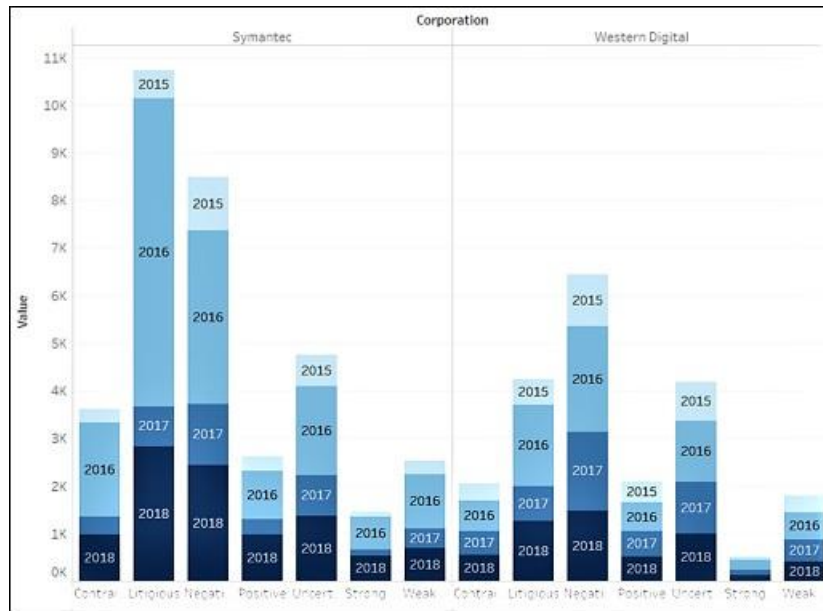


FIGURE 1.

Sentiment scores of Symantec and Western Digital

Shape two demonstrates quite a few all of idea sorts by simply business examined through 2015 : 2018. Quickly, it would appear that typically the proportionalities associated with notion results are very similar, whatever the kind of belief. The best recognizable illustration is coming from Symantec, where the 2016 ensemble is definitely the biggest. But, their feeling ratings to get bad plus great appears to be the exact same dimension, even though inside is important these are distinctive. The phrase matters are varied since there is the issue for the good wordlist, since it is an extremely little listing of 353 key phrases in comparison to the damaging set of a couple of, 337 sayings, like (Loughran in addition to Mcdonald, 2011). Consequently , there can be dilemma when the greetings would be to mirror within consonant while using period of ensemble, for the reason that both equally adverse and even impressive emotions currently have improved with all the entire docs. This particular the actual contrast hard and the have to discover solutions to drill down into every opinion enabling even more significant facts for being based on the particular 10-K reviews. In the event ratings would be to be produced resistant to the economic parameters, to illustrate income together with net gain, more issues occur regarding exactly how reputable the particular results may reveal typically the fiscal outcomes

Number several examines the web salary together with the positive/negative ratings designed for Berkshire Hathaway and even Ms. Though Berkshire Hathaway a new substantial net gain throughout year or so 2017, the particular verse ratings failed to echo exactly the same message, where good credit score just for 2017 truly took place, as the

damaging results continued to be about precisely the same through the decades. The identical could be explained for the purpose of Microsof company, where their net gain is optimum within 2017, and then the lose within 2018. Even though it is very damaging rating seemed to be cheapest inside twelve months 2017, it is favorable feeling ratings would not reveal similar craze, using the finest favourable ratings displayed throughout season 2018 rather than 2017

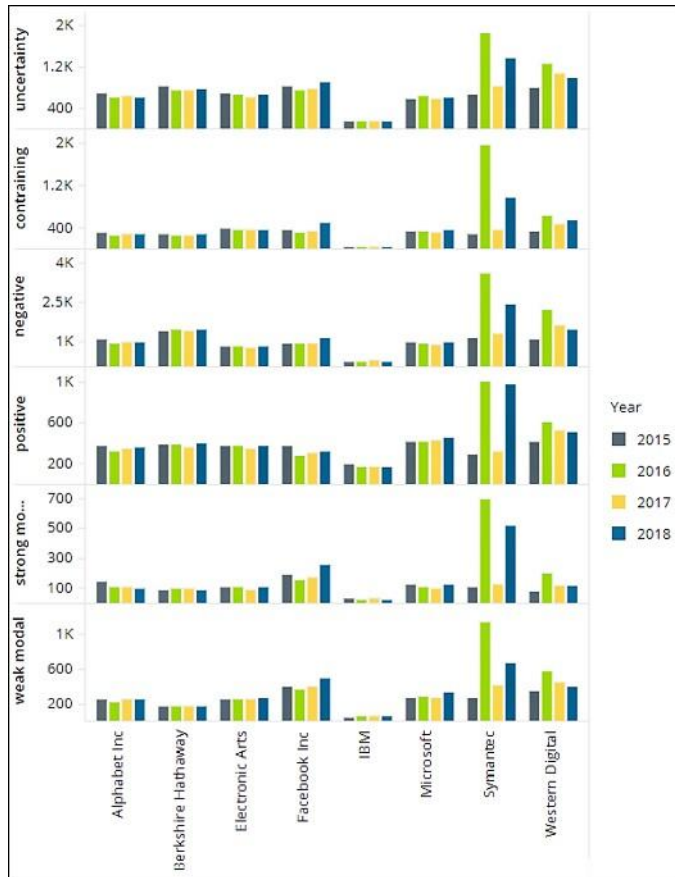


FIGURE 2.

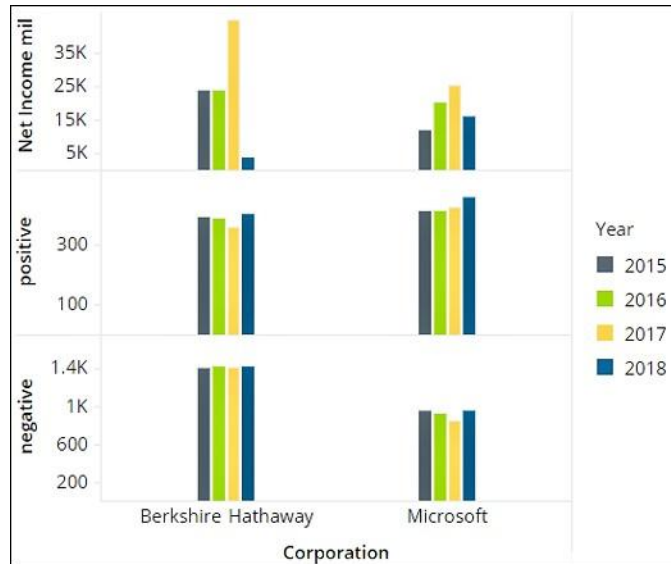


FIGURE 3.

Compares the net income with the positive/negative scores for Berkshire Hathaway and Microsoft.

In the assessment outcomes of Phase a single rendering, it really is discovered that will statistical ratings in-

clude restricted talents in assisting the particular expert of any monetary are accountable to understand more in depth observations ideal for investing choice or even various other objective such as evaluating towards some sort of rival.

Results evaluation of stage 2 implementation

from your check outcomes of condition one execution, there exists a requirement for additional drill down straight down associated with evaluation in to the 10-k statement, to check out methods to get yourself and a lot more informative see showing how companies carry out through 12 months upon yr foundation. Phase two execution is principally dedicated to the particular evaluation regarding phrase eq, and exactly how typically the factors could be strained additional in order to obtain the comparison see associated with phrase matters through year upon year for every company. These execution answers are obtained from the particular 10-k

statement assessment associated with abece inc's 10-k reviews with regard to 12 months 2016 versus 2017.

Analysis of null terms

the objective of examining null conditions is to discover which usually conditions are usually brand new for that 12 months, plus the conditions which have been eliminated within the 10-k statement. filter systems are applied to phrase eq associated with 2016 plus 2017 correspondingly in order to identify all those conditions which usually happened within 2016 unfortunately he taken out inside 2017, in addition to the other way round. for instance , phrases that are completely new throughout 2017 (null within 2016), where the filtration system regarding eleven matters is put on 2017 phrase eq, include the particular words "americas", "apac", "emea", "fine" and even "provisional". conditions which usually come in 2017 yet failed to happen inside 2016 contain "kingdom" together with "rest".

Analysis of +TF & -TF

Right after examining the particular null conditions, what exactly is remaining are those that happened both in many years of the particular 10-K statement, nevertheless a few phrases may have a greater rate of recurrence (+TF) while some possess a reduce regularity (-TF). In order to the present words having a higher +TF or even -TF, the filtration system could be used. The particular blocking procedure will be very subjective, which can be decreased upon improved depending upon how a lot information is usually to be analysed. Determine four displays a new strained outcome beginning in ten as this filtration system count number signifies around the very best fifty from the complete terminology along with +TF. Quickly, the particular expert may identify, for instance , a higher TF distinction for that phrase "tax". The particular blocking procedure can also be put on produce a listing of -TF, because demonstrated within the Physique five. Quickly, typically the expert may identify, for instance , a higher TF variation for that phrase "million".

Filtered re-
sult of +TF. Filtered
result of -TF.

To completely translate the outcomes produced within the TF assessment, there exists a have to confirm the final results via taking a look at the entire which means of every phrase in respect in order to the related phrases inside the 10-K reviews. For instance , from your leads to area four. second . one Evaluation associated with Null Conditions, it had been pointed out that this phrase "kingdom" happened along with higher frequency within 2016 yet has disappeared within 2017. An additional instance will be the higher TF distinction with regard to "tax" inside area some. second . two Research associated with +TF and -TF, where the word "tax" seems inside a higher rate of recurrence throughout 2017 in comparison to 2016. You will find 2 ways of affirmation tried with this research. The very first is with the L bundle regarding "qdap" that is a good evaluation package deal in order to parse textual content and this particular situation, removing related content. The particular Ur deal assists with taking out paragraphs with a recognition from the term "kingdom", producing the csv document which usually consists of almost all phrases that have the term "kingdom". From your csv document, the particular expert may understand the actual phrases will be showing around the phrase "kingdom", which this specific situation, will be saying that will income are usually acknowledged through "United Kingdom". The word will be describing the united kingdom organization, and exactly how Abece Incorporation continues to be categorizing their monetary outcomes depending on segmentation involving UNITED

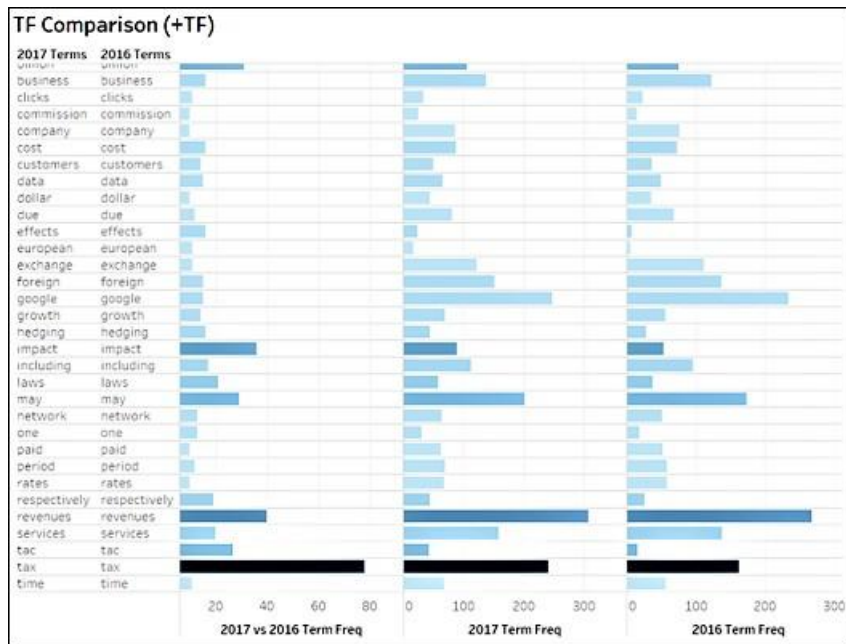


FIGURE 4.

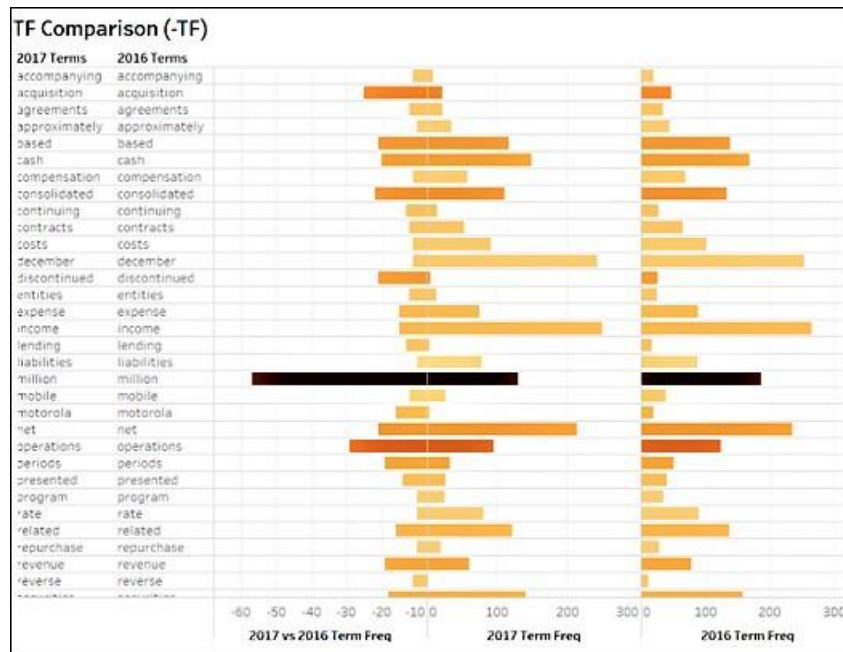


FIGURE 5.

KINGDOM plus remaining globe within the 12 months 2016, yet no more the situation within 2017. This may become a sign from the management’s choice to be able to change it is concentrate far from great britain marketplace because it seems that will much less significance continues to be put on typically the segmentation from the BRITISH industry via eliminating this kind of segmentation within yr 2017.

Nevertheless , it really is noticed there is a new restriction towards the “qdap” bundle with regard to content removal. When this technique will be put on conditions having a higher frequency, such as "tax", that has made an appearance 240 occasions within the 2017 10-K statement versus 162 occasions inside the 2016 record, it truly is discovered it grew to become hard to obtain significant knowing. The easy cause is the fact that you will find way too many paragraphs inside the csv record plus going through the particular huge associated with essay sentences in order to obtain which means is simply too time intensive. In order to conquer this issue, DiffChecker (Diffchecker, 2021) is usually used. Via a research from the expression "tax", this particular system instantly shows the phrase, which makes it simpler to identify the

definition of whilst checking typically the phrases. Determine six displays the particular DiffChecker lite where the term “tax” took place within the 2017 statement, saying "Our efficient taxes price might change later on due to the particular Taxes Take action, that was passed up on Dec 22. inch This means that

typically the emotion from the company, where seems unclear regarding long term tax-
es prices.

```
1011 Furthermore, due to shifting economic and political conditions, tax policies,  
1012 laws or rates in various jurisdictions  
1013 may be subject to significant change, which could materially affect our finan  
1014 cial position and results of operations.  
1015 The ongoing effects of the tax Act and the refinement of provisional estimate  
1016 s could make our results  
1017 difficult to predict.  
1018 Our effective tax rate may fluctuate in the future as a result of the Tax Ac  
1019 t, which was enacted on December 22,  
1020 2017. The tax Act introduces significant changes to U.S. income tax law that  
1021 will have a meaningful impact on our  
1022 provision for income taxes. Accounting for the income tax effects of the tax  
1023 Act requires significant judgments and  
1024 estimates in the interpretation and calculations of the provisions of the tax  
1025 Act.  
1026 Due to the timing of the enactment and the complexity involved in applying th  
1027 e provisions of the tax Act, we made  
1028 reasonable estimates of the effects and recorded provisional amounts in our f  
1029 inancial statements for the year ended  
1030 December 31, 2017. The U.S. Treasury Department, the Internal Revenue Service  
1031 (IRS), and other standard-setting  
1032 bodies may issue guidance on how the provisions of the tax Act will be applie  
1033 d or otherwise administered that is  
1034 different from our interpretation. As we collect and prepare necessary data,  
1035 and interpret the tax Act and any additional  
1036 guidance issued by the IRS or other standard-setting bodies, we may make adju  
1037 stments to the provisional amounts  
1038 that could materially affect our financial position and results of operations  
1039 as well as our effective tax rate in the period  
1040 in which the adjustments are made.
```

FIGURE 6.

The DiffChecker result where the word “tax” occurred in the 2017 report.

The outcomes may also be authenticated contrary to the unfavorable emotion listing, that was exactly the same

checklist utilized in Phase one to have an unfavorable emotion rating. Nonetheless, the foundation associated with assessment differs with regard to Period two, where the particular unfavorable listing is utilized in order to towards all of the conditions inside the 10-K reviews when compared. The primary goal is in order to confirm set up bad terms come in all those strained +TF/-TF evaluations.

CONCLUSION

Delete word books shows that will experts utilized a number of software program,

equipment plus techniques to create emotion ratings upon 10-K reviews. You will find a number of literatures which usually produced applied from the belief wordlist produced by Loughran plus McDonald (2011), therefore Phase one execution utilizes exactly the same listings to learn current strategy associated with processing emotion results for that 10-K information. The outcomes recommended that will essential information could be produced from the particular 10-K reviews, that is a sign from the corporation's procedure plus techniques. Within the 1st phase regarding execution, the outcomes from your feeling ratings pointed out that will, even though results possess an obvious indicator of the belief, this is at the rear of typically the ratings must be construed cautiously. Within the 2nd period associated with setup, the particular effectiveness in the TF evaluation is authenticated via coordinating involving phrases contrary to the conditions recognized within the TF assessment. Additionally, this particular research furthermore offers an execution arrange for experts plus

traders via procedure for drill down into the particular 10-K textual content. It is a step by step technique associated with evaluation which may be summarised in to a few actions. Things are usually highlighted additional within the subsequent factors:

we. Evaluation associated with null phrase include conditions which often happened in a single 12 months, however, not another. The particular assessment must be finished each many years, for example. operating each methods to acquire null phrases.

2. Evaluation regarding +TF and -TF, where the particular conditions are usually structured in addition to strained in to those that possess the greatest rate of recurrence variations. The particular blocking requirements depends around the general eq with the words, when the majority of terminology possess higher frequency variations, then the increased filtration system must be used.

3. Affirmation involving recognized conditions towards real phrases within 10-K ought to be performed in the last stage, following the eq are usually in comparison, to ensure that significant information may be produced. This task can be executed making use of software program or even some other related resources.

Typically the discernment on the expert is going to be important whenever discovering typically the effectiveness from the 10-K, considering the particular intention of this statement producer as well as the producing difficulty of your 10-K created. From your forms of disclosures noticed inside the 10-K statement, long term studies required to discover what sort of corporate's technique is associated with the amount plus high quality associated with disclo-

asures. Because the part of danger and even MDA continues to be resolved by many people experts, other locations such as taxes, lawful procedures plus inner regulates may be regions of attention with regard to long term analysis. This particular research offers restricted the range in order to 10-K studies, where evaluation is targeted around the textual content included inside the 10-K. Some other calcado causes of information, social networking together with pr campaigns might existing a fascinating study element.

ACKNOWLEDGEMENT

This particular function has been backed from the APU Teachers Study Give plan, task quantity: APURDG/01/2019.

REFERENCES

- A A, M P, Hamdi M, Bourouis S, Rastislav K and Mohamed F (2022) Evaluation of Neuro Images for the Diagnosis of Alzheimer's Disease Using Deep Learning Neural Network. *Front. Public Health* 10:834032. doi: 10.3389/fpubh.2022.834032
- Aliyar Agagul oglu Orujov. (2021). Approaches of Azerbaijani researchers to the concept of ideology and national ideology. *Science, Education and Innovations in the Context of Modern Problems Conference, Baku, Azerbaijan, November, 2021, 4(2), 146–153.* <https://doi.org/10.5281/zenodo.6287217>
- Anna Barikova, Yan Bernaziuk. (2021). Electronic educational dimension of law enforcement in a pandemic and post-pandemic World. *Science, Education and Innovations in the Context of Modern Problems Conference, Baku, Azerbaijan, November, 2021, 4(2), 91–104.* <https://doi.org/10.5281/zenodo.6299889>
- Aysel Soltanova. (2021). The role of media in language change. *Science, Education and Innovations in the Context of Modern Problems, 04-06 NOV, 2021, 4(2), 194–196.* <https://doi.org/10.5281/zenodo.6299051>
- B. Lee, J. Park, L. Kwon, Y. Moon, Y. Shin, G. Kim, and H. Kim, *Journal of Open Innovation: Technology, Market, and Complexity* 4–4 (2018).
- B. Lev, *Accounting and Business Research* 48, 465–493 (2018).
- Bin Yuan, M. M. Kamruzzaman, Shaonan Shan, "Application of Motion Sensor Based on Neural Network in Basketball Technology and Physical Fitness Evaluation System", *Wireless Communications and Mobile Computing*, vol. 2021, Article ID 5562954,

- 11 pages, 2021. <https://doi.org/10.1155/2021/5562954>
- Chaturvedi, E. Cambria, R. Welsch, and F. Herrera, 2018.
- Chi, Z., Jiang, Z., Kamruzzaman, M.M. et al. Adaptive momentum-based optimization to train deep neural network for simulating the static stability of the composite structure. *Engineering with Computers* (2021). <https://doi.org/10.1007/s00366-021-01335-5>
- Chu Binh An. (2021). Educational system in Vietnamese feudal period. *Science, Education and Innovations in the Context of Modern Problems Conference*, Baku, Azerbaijan, November, 2021, 4(2), 139–145. <https://doi.org/10.5281/zenodo.6299014>
- Chystokletov Leontii Grugorovych, Ostapenko Oleksii Ivanovych, Khytra Oleksandra Leontiiivna, Baik Oksana Ivanivna, Kryzhanovskyi Anatolii Stanislavovych. (2021). THE ROLE OF JUDICIAL BODIES IN PROCEEDINGS IN CASES OF MILITARY ADMINISTRATIVE OFFENCES IN UKRAINE. *Science, Education and Innovations in the Context of Modern Problems Conference*, Baku, Azerbaijan, November, 2021, 4(2), 68–77. <https://doi.org/10.5281/zenodo.6299872>
- D. . Diffchecker, ed., (2021).
- Eldar Jalilov, Panah Mammadov. (2021). Some considerations on the prospects of the real estate sector in Azerbaijan. *Science, Education and Innovations in the Context of Modern Problems Conference*, Baku, Azerbaijan, November, 2021, 4(2), 78–81. <https://doi.org/10.5281/zenodo.6299876>
- Elmurotova Dilnoza Bahtiyorovna I., Mussaeva Malika Anvarovna II., Ismatova Lobar Numonovna I, Xaitov Farxod NasriddinovichI. (2021). Enhancement of electroluminescence of znse/zno:o,zn nanoheterojunctions after proton irradiation. *Science, Education and Innovations in the Context of Modern Problems Conference*, Baku, Azerbaijan, November, 2021, 4(2), 162–166. <https://doi.org/10.5281/zenodo.6287599>
- F. Li, *Journal of Accounting Research* 48, 1049–1102 (2010).
- Gulshan Hajiyeva. (2021). TEACHING BIOLOGY TEACHING METHODOLOGY IN HIGHER PEDAGOGICAL SCHOOLS. *Science, Education and Innovations in the Context of Modern Problems Conference*, Baku, Azerbaijan, November, 2021, Baku. <https://doi.org/10.5281/zenodo.6337198>
- Guobin Chen, Zhiyong Jiang, M.M. Kamruzzaman. (2020). Radar remote sensing image retrieval algorithm based on improved Sobel operator, *Journal of Visual Communi-*

ation and Image Representation, Volume 71, 2020, 102720, ISSN 1047-3203

<https://doi.org/10.1016/j.jvcir.2019.102720>

Guobin Chen, Zhiyong Jiang, M.M. Kamruzzaman. (2020). Radar remote sensing image retrieval algorithm based on improved Sobel operator, *Journal of Visual Communication and Image Representation*, Volume 71, 2020, 102720, ISSN 1047-3203
<https://doi.org/10.1016/j.jvcir.2019.102720>

Hazdayka-Vasylyshyn Iryna Bogdanivna¹, Gapchich Vitaliy Oleksiivuch², Marin Oleksandr Kostiantunovuch³, Romantsova Svitlana Vasulivna⁴, Sozanskyi Taras Ivanovuch⁵. (2021). Deprecation of the criminal ban. *Science, Education and Innovations in the Context of Modern Problems Conference*, Baku, Azerbaijan, November, 2021, 4(2), 167–177. <https://doi.org/10.5281/zenodo.6287701>

Humeyir Ahmadov. (2021). JADIDISM MOVEMENT AND ITS INTEGRATION INTO THE EDUCATION SYSTEM OF THE TURKISH PEOPLE. *Science, Education and Innovations in the Context of Modern Problems Conference*, Baku, Azerbaijan, November, 2021, 4(2), 9–14. <https://doi.org/10.5281/zenodo.6284077>

Huseynova Aynur Kardash khızı. (2021). Implementation of "East-West" and "North-South" Transport corridors. *Science, Education and Innovations in the Context of Modern Problems Conference*, Baku, Azerbaijan, November, 2021, 4(2), 245–272. <https://doi.org/10.5281/zenodo.6299104>

J. Campbell, H. Chen, D. Dhaliwal, H. Lu, and L. Steele, 2021.

Jamshid Sharafetdinovich Tukhtabaev. (2021). Prospects for the establishment and development of fat clusters in food safety. *Science, Education and Innovations in the Context of Modern Problems Conference*, Baku, Azerbaijan, November, 2021, 4(2), 113–128. <https://doi.org/10.5281/zenodo.6299900>

K. Huang and Z. Li, *SSRN Electronic Journal* (2011).

K. Lo, F. Ramos, and R. Rogo, *Journal of Accounting and Economics* 63, 1–25 (2017).

L. Guo, F. Shi, and J. Tu, *The Journal of Finance and Data Science* 2, 153–170 (2016).

M. Cecchini, H. Aytug, G. Koehler, and P. Pathak, 2010.

MM Kamruzzaman, Bingxin Yan, Md Nazirul Islam Sarker, Omar Alruwaili, Min Wu, Ibrahim Al-rashdi. (2022). Blockchain and Fog Computing in IoT-Driven Healthcare Services for Smart Cities. *Journal of Healthcare Engineering*, Volume 2022, <https://doi.org/10.1155/2022/9957888>

- Mubariz Yolchiyev. (2021). Legal means that can be used to protect copyright. Science, Education and Innovations in the Context of Modern Problems Conference, Baku, Azerbaijan, November, 2021, 4(2), 30–37.
<https://doi.org/10.5281/zenodo.6284887>
- Muniyappan, A.; Sundarappan, B.; Manoharan, P.; Hamdi, M.; Raahemifar, K.; Bourouis, S.; Varadarajan, V. Stability and Numerical Solutions of Second Wave Mathematical Modeling on COVID-19 and Omicron Outbreak Strategy of Pandemic: Analytical and Error Analysis of Approximate Series Solutions by Using HPM. Mathematics 2022, 10, 343. <https://doi.org/10.3390/math10030343>
- Nguyen Hoang Lam. (2021). Research on the extraction of polysaccharides from Ganoderma lucidum. Science, Education and Innovations in the Context of Modern Problems Conference, Baku, Azerbaijan, November, 2021, 4(2), 226–227.
<https://doi.org/10.5281/zenodo.6299094>
- Nguyen Thanh Lam. (2021). International business ethics: Corporate social responsibility (CSR) of Taiwanese enterprise applies in Vietnam. Science, Education and Innovations in the Context of Modern Problems Conference, Baku, Azerbaijan, November, 2021, 4(2), 210–225. <https://doi.org/10.5281/zenodo.6299080>
- Nguyen Tran Tan Hiep. (2021). Diplomatic relations of Azerbaijan – Vietnam: similarities in development. Science, Education and Innovations in the Context of Modern Problems Conference, Baku, Azerbaijan, November, 2021, 4(2), 105–111.
<https://doi.org/10.5281/zenodo.6299895>
- Nurmuhammadi Samira. (2021). Practical materials for training optimization Study problems by math. Science, Education and Innovations in the Context of Modern Problems Conference, Baku, Azerbaijan, November, 2021, 4(2), 15–20.
<https://doi.org/10.5281/zenodo.6284452>
- Olimjonov Khabibjon Abdukhalim oqli. (2021). The history of the libraries in Turkistan (1870-1917 YEARS). Science, Education and Innovations in the Context of Modern Problems Conference, Baku, Azerbaijan, November, 2021, 4(2), 82–90.
<https://doi.org/10.5281/zenodo.6299880>
- Otakulov Salim. Sobirova Gulandon Davronovna. (2021). The Nonsmooth optimal control problem for differential inclusion with parameter. Science, Education and Innovations in the Context of Modern Problems Conference, Baku, Azerbaijan, Novem-

- ber, 2021, 4(2), 154–161. <https://doi.org/10.5281/zenodo.6287331>
- P. Hájek, *Neural Computing and Applications* 29, 343–358 (2017).
- Poongodi, M., Hamdi, M., & Wang, H. (2022). Image and audio caps: automated captioning of background sounds and images using deep learning. *Multimedia Systems*, 1-9. <https://doi.org/10.1007/s00530-022-00902-0>
- Poongodi, M., Hamdi, M., Gao, J., & Rauf, H. T. (2021, December). A Novel Security Mechanism of 6G for IMD using Authentication and Key Agreement Scheme. In 2021 IEEE Globecom Workshops (GC Wkshps) (pp. 1-6). IEEE., Spain, DOI: 10.1109/GCWkshps52748.2021.9715537
- Poongodi, M., Nguyen, T. N., Hamdi, M., & Cengiz, K. (2021). A Measurement Approach Using Smart-IoT Based Architecture for Detecting the COVID-19. *Neural Processing Letters*, 1-15. <https://doi.org/10.1007/s11063-021-10602-x>
- Rakhimov Vladimir Shavkatovich 1 Almakaeva Rumiy Muxammadievna 2 Kadirov Abdurashid Abduganievich 3. (2021). Technology of conducting physical education classes with the use of modern non-traditional types of health related physical culture. *Science, Education and Innovations in the Context of Modern Problems Conference*, Baku, Azerbaijan, November, 2021, 4(2), 183–193. <https://doi.org/10.5281/zenodo.6287916>
- Ramesh, T. R., Vijayaragavan, M., Poongodi, M., Hamdi, M., Wang, H., & Bourouis, S. (2022). Peer-to-peer trust management in intelligent transportation system: An Aumann's agreement theorem based approach. *ICT Express*. <https://doi.org/10.1016/j.icte.2022.02.004>
- Rasul.T. Ruzmetov. (2021). Technology of organization of physical education and sport at the desire of students. *Science, Education and Innovations in the Context of Modern Problems Conference*, Baku, Azerbaijan, November, 2021, 4(2), 178–182. <https://doi.org/10.5281/zenodo.6287803>
- Rauf Huseynov. Naghdali Rzayev. (2021). On Azerbaijan's economy in 2021 and overcoming the inevitable crisis through integration into the European Union. *Science, Education and Innovations in the Context of Modern Problems Conference*, Baku, Azerbaijan, November, 2021, 4(2), 38–42. <https://doi.org/10.5281/zenodo.6285066>
- S. Chan and M. Chong, 2017.

- S. Shayaa, N. Jaafar, S. Bahri, A. Sulaiman, P. S. Wai, Y. W. Chung, A. Piprani, and M. Al-Garadi, Sentiment Analysis of Big Data: Methods, Applications, and Open Challenges 6, 37807–37827 (2018).
- Samir Ismayilov. (2021). The Parliament Decisions in Azerbaijan: The Case of Establishing Legislative. Science, Education and Innovations in the Context of Modern Problems Conference, Baku, Azerbaijan, November, 2021, 4(2), 236–244.
<https://doi.org/10.5281/zenodo.6299098>
- Sevinj Rasulova. (2021). On the history of national children's literature in the Azerbaijani literature. Science, Education and Innovations in the Context of Modern Problems Conference, Baku, Azerbaijan, November, 2021, 4(2), 205–210.
<https://doi.org/10.5281/zenodo.6299071>
- Shamil Alifov. (2021). CLASSIFICATION AND LABELING OF FOOD ADDITIVES. Science, Education and Innovations in the Context of Modern Problems Conference, Baku, Azerbaijan, November, 2021, 4(2), 21–29.
<https://doi.org/10.5281/zenodo.6284739>
- T. Dyer, M. Lang, and L. Stice-Lawrence, Journal of Accounting and Economics 64, 221–245 (2017).
- T. Kang, D. Park, and I. Han, Telematics and Informatics 35, 370–381 (2018).
- T. L. Zeller, B. B. Stanko, and H. Jin, Academy of Accounting and Financial Studies Journal 16, 1–1 (2012).
- T. Loughran and B. McDonald, SSRN Electronic Journal (2016).
- T. Loughran and B. McDonald, The Journal of Finance 66, 35–65 (2011).
- Tursunov Ulugbek Sativoldievich. (2021). Formation and development of rent, leasing in Uzbekistan. Science, Education and Innovations in the Context of Modern Problems Conference, Baku, Azerbaijan, November, 2021, 4(2), 197–204.
<https://doi.org/10.5281/zenodo.6299067>
- W. Mayew, M. Sethuraman, and M. Venkatachalam, The Accounting Review 90, 1621–1651 (2014). Bharat S. Rawal, Poongodi M., Gunasekaran Manogaran, and Mounir Hamdi. 2021. Multi-Tier Stack of Block Chain with Proxy Re-Encryption Method Scheme on the Internet of Things Platform. ACM Trans. Internet Technol. 22, 2, Article 41 (May 2022), 20 pages. <https://doi.org/10.1145/3421508>
- Xing Li, Junpei Zhong, M.M. Kamruzzaman, “Complicated robot activity recognition by quality-

aware deep reinforcement learning”, *Future Generation Computer Systems*, Volume 117, 2021, Pages 480-485.

Y. Liu and K. Moffitt, *Journal of Emerging Technologies in Accounting* 13, 85–94 (2016).

Y. Shi, S. Wang, S. Zhou and M. M. Kamruzzaman. (2020). Study on Modeling Method of Forest Tree Image Recognition Based on CCD and Theodolite. *IEEE Access*, vol. 8, pp. 159067-159076, 2020, doi: 10.1109/ACCESS.2020.3018180

Y. Shi, S. Wang, S. Zhou and M. M. Kamruzzaman. (2020). Study on Modeling Method of Forest Tree Image Recognition Based on CCD and Theodolite. *IEEE Access*, vol. 8, pp. 159067-159076, 2020, doi: 10.1109/ACCESS.2020.3018180

Yuanjin Xu, Ming Wei, M.M. Kamruzzaman, Inter/intra-category discriminative features for aerial image classification: A quality-aware selection model, *Future Generation Computer Systems*, Volume 119, 2021, Pages 77-83, ISSN 0167-739X, <https://doi.org/10.1016/j.future.2020.11.015>.

Yunus Ibrahimov, Namig Abdullayev, Israfilov Ramin,. (2021). Some considerations about the need to turn the beneficiary into taxpayers. *Science, Education and Innovations in the Context of Modern Problems Conference*, Baku, Azerbaijan, November, 2021, 4(2), 65–67. <https://doi.org/10.5281/zenodo.6299866>