



**Volume 8
2024**

E-ISSN 2753-6408

INTERNATIONAL INTERDISCIPLINARY CONFERENCE:

**RESEARCH AND INNOVATION
2024**

**22 March, 2024
London, United Kingdom**

Editor in Chief

Dr., Prof. Svetlana Drobyazko, European Academy of Sciences Ltd, London, United Kingdom

Editorial board

Prof., Dr. Andrej Udovč, Full Professor, University of Ljubljana, Slovenia
Prof., Dr. Brezina Ivan, Faculty of Economic Informatics, The University of Economics in Bratislava (Slovakia) Website
Prof., Dr. Dimitar Kanev, Professor in Behavioral Sciences at Varna Free University and Nikola Vaptsarov Naval Academy, Bulgaria
Prof., Dr. Konstantin Savov Kalinkov, University of Economics (Varna, Bulgaria)
Prof., Dr. Nikolay Majurov, St. Petersburg Law Academy, Russia
Prof. Dr. Nadya Dimitrova Mironova, University of National and World Economy, Bulgaria
Dr. Nedelea Alexandru-Mircea, Associate Professor of Marketing at the University Stefan cel Mare of Suceava (Romania)
Prof., Dr. Valeriy Okulich-Kazarin, School of Entrepreneurship, Wroclaw University of Environmental and Life Sciences, Wroclaw (Poland)
Assist. Prof. Dr. Reena Agrawal Jaipuria Institute of Management, India
Assoc. Prof. Dr. Ruta Sneidere, University of Latvia
Prof., Dr. Parikshat Singh Manhas, Director School of Hospitality and Tourism Management, Faculty of Business Studies, University of Jammu (India)
Prof., Jarosław Jerzy Turłukowski, Assistant Professor Institute of Civil Law University of Warsaw (Poland)
Prof., Dr. Nada Vignjević-Djordjević, Associate Professor State University (Novi Pazar, Serbia)
Dr. Alexandrina Maria Pauceanu, Geneva Business School, Geneva, Switzerland
Dr. Arjeta Hallunovi, Aleksander Moisiu University, Albania
Dr. Sahera Hussein Zain Al-Thalabi, Faculty of Management and Economics, Basra University (Iraq)
Dr. Luísa Cagica Carvalho, Institute Polytechnic of Setubal, School of Business and Administration; University of Evora, Portugal
Prof. Dr. Badar Alam Iqbal, University of South Africa
Ph.D., Assoc. Prof. Octavian Dospinescu, Faculty of Economics and Business Administration, University Alexandru Ioan Cuza University (Romania)
Prof., dr.sc. Dragan Cacic, Department of Informatics, University of Rijeka (Republic of Croatia), European Academy of Sciences and Arts (full member)
Ph.D. Busra Kaya, Ankara Haci Bayram Veli University, Batman, Turkey
Assoc. Prof. Dr. Christina Koutra, Abu Dhabi University's College of Business, UAE

CONTENT

Suyoto, Arisul Ulumuddin, Husnul Hadi

THE IMPLEMENTATION PROCESS AND ITS RESULTS ON
 BLENDED LEARNING IN PGRI SEMARANG UNIVERSITY 4

Denisa Kurtaj

MAXIMIZING FARMER'S INCOME IN ALBANIA: EXPLORING
 THE IMPACT OF COOPERATIVES IN AGRICULTURE 13

Kateryna Molchanova, Kostiantyn Olefirenko,

Grygoriy Shamborovskyi, Iryna Kyrchata

INFORMATION PROCESSES IN MODERN ENTERPRISE
 MANAGEMENT IN THE SYSTEM OF VIRTUAL ECONOMY 23

Aims & Scope (Education)

Article

THE IMPLEMENTATION PROCESS AND ITS RESULTS ON BLENDED LEARNING IN PGRI SEMARANG UNIVERSITY

Suyoto,

Universitas PGRI Semarang, Indonesia
<https://orcid.org/0009-0003-1686-0988>

Arisul Ulumuddin,

Universitas PGRI Semarang, Indonesia
<https://orcid.org/0000-0002-2089-8298>

Husnul Hadi,

Universitas PGRI Semarang, Indonesia
<https://orcid.org/0000-0003-4077-1865>

Received: 24 January 2024; Accepted: 29 January 2024; Published: 30 January 2024

Abstract. Online lecturing during Covid-19 pandemic is the most appropriate method to carry out the learning process for colleges. This lecture activity able to be carried out through various learning applications such as WA Group, Google Classroom, Zoom, Google Meet etc. from time to time due to the pandemic transition status to PPKM 1, the policy of implementing online learning is entering the transition stage to offline learning, by applying mixed method. It is done by combining both of quantitative and qualitative research methods. This is based on the results of online learning is less than optimal when compared to the process carried out face-to-face at university. Blended learning in PGRI University Semarang has been carried out long after the pandemic status was at the PPKM level 1. Therefore, it is necessary to monitor and evaluate the implementation of blended learning in PGRI University Semarang through online and offline learning guideline mechanisms by the Quality Assurance Institute. This study aims to analyze lecturing both of process and results through the blended learning method.

Keywords: blended learning, PGRI University, learning application, Covid-19 Pandemic.

Citation: Suyoto; Arisul Ulumuddin; Husnul Hadi. (2024). THE IMPLEMENTATION PROCESS AND ITS RESULTS ON BLENDED LEARNING IN PGRI SEMARANG UNIVERSITY. *Conferencii*, (8) 1. http://doi.org/10.51586/Conferencii_8_1_2024

Introduction

According to the regulation from (Pendidikan, 2020) concerning the Prevention of Covid-19 pandemic in Education Units as an anticipation of the Corona virus separation at those schools and colleges. The Central Java Provincial Government has established the emergency response status for the Corona Virus Disease (Covid-19) disaster. This was determined in Semarang by the Governor of Central Java named Ganjar Pranowo, in the Decree of the Governor of Central Java Number 360/3/Year 2020 and regarding the study from (Sisilia et al., 2022) concerning the Determination of the Emergency Response Status of the Corona Virus outbreak (Covid-19) Disaster in Central Java Province, dated March 27, 2020. Thus, the implementation of academic activities during the emergency period of Covid 19 separation in PGRI Semarang University eliminated face-to-face learning activities and replaced them by working from home (WFH) and learning from home (LFH) through online learning along with various media. This is in line with the Rector's Circular Letter No. 033/R/UPGRIS/III/2020 concerning Basic Protection, Early Detection of Health and Appeals for Foreign Travel to Face the Corona Virus Outbreak (COVID-19). Those activities are implemented due to prevent and avoid the Covid-19 separation which is currently spreading in several countries, including Indonesia. Working from home (WFH) and learning from home (LFH),

physical distancing and spending time in crowded place are considered as the best ways to break the chain of its separation.

Through online learning, students able to study as usual and are not going to left behind lecturing materials, as well as more flexible time. However, online learning is not entirely welcomed by students, because there are some students who consider online learning more difficult than common learning, not to mention that internet quota has to be available and it becomes the biggest difficulty experienced by students, network constraints, availability of learning devices such as laptops, the level understanding of the material that is felt better if doing face-to-face lecturing, in addition both of lecturers and students haven't been ready to operate the online learning system quickly, including preparing lecturing materials digitally. Online lecturing during the Covid-19 pandemic becomes the most appropriate method to carry out the learning process for students. The activity able to be done through various learning applications such as WA Group, Google Classroom, Zoom, Google Meet etc.

From time to time along with the transformation of pandemic status to PPKM 1, the policy implementation of online learning is entering the transition stage to offline learning. This condition is based on the results of online learning is less than optimal when compared to the process carried out face-to-face at university. Blended learning activity in PGRI University Semarang has been carried out long after the pandemic status was at the PPKM 1 level. Therefore, it is necessary to monitor and evaluate the implementation of blended learning in PGRI University Semarang through online and offline learning guideline mechanisms by Institute of Quality Assurance.

Methods

This research applies a mixed method, while this implementation is by combining quantitative and qualitative research methods. This type of mixed research uses sequential explanatory strategies. Mixed research is a procedure for collecting, analyzing, and mixing quantitative and qualitative methods in series of a study to understand research problems, (Creswell, 2018), in line with study from (R. Burke Johnson, University of South Alabama; Larry Christensen, 2014) stated that mix research is a class of research studies in which researchers mix or combine quantitative and qualitative research approaches as well as techniques in a single research study. This research is useful for describing complex phenomenon, deciding comparisons between cases, and this research is able to analyze the combined results of quantitative and qualitative research so that the data will be clearer and complementary.

This study is applying mixed research with sequential exploratory methods, namely research starting from the collection of qualitative descriptive data to describe how the process in the implementation of blended learning lectures are started from preparation, implementation of learning, evaluation, and reflection. Furthermore, quantitative data collection was carried out to determine the results and effectiveness of blended learning. The first result is used to answer the first question, and vice versa. Furthermore, those two results are combined to find out the implementation illustration of blended learning lectures intact. This type of mixed research uses sequential explanatory strategies.

The population in this study is students of PGRI Semarang University. Data collection for the blended learning lecture process was classified by using questionnaires for the implementation of blended learning lectures filled out by students through google form. The second data is student learning results / achievements downloaded from SIMEKAR UPGRIS. Data analysis techniques are carried out by using various stages such as follows: (1) descriptive analysis, (2) interactive analysis, and (3) quantitative analysis. The blended learning lecture process has been carried out in PGRI Semarang University in well condition accordance with national higher education standardizations which include: 1) graduate competency standards, 2) learning content standards, 3) learning process standards, 4) learning assessment standards, 5) lecturer and education staff standards, 6) learning facilities and infrastructure standards, 7) learning management standards, and 8) learning financing standards.

Population is the whole subject of study, both of a group of people, objects, or things. According to (Sugiyono, 2014) mentioned that population is an area or generalization consisting of objects/ subjects that have certain qualities and characteristics set by researchers to be studied and

defined conclusions. The population in this study is students of PGRI Semarang University, the sample is part of the number or representative of the population to be studied. According to (Cortini, 2014) mentioned that the sample is part of the number and characteristics possessed by the population. Data collection for the blended learning lecturing process was classified by using questionnaires as the implementation of blended learning lecturing filled out by students through google form. The second data is student learning results/achievements downloaded from SIMEKAR UPGRIS. Data analysis techniques are carried out by using such as follows: (1) descriptive analysis, (2) interactive analysis, and (3) quantitative analysis.

Results and Discussion

Referring to the research data collected through filling out online questionnaires through google form on 195 students and 63 lecturers’ respondents from the Department Program. The data obtained from this study includes national standards of higher education. National standards for higher education according to (Sitorus, 2021) concerning on National Higher Education Standards, consist of as follows: 1) alumni competency standards, 2) learning subject standards, 3) learning process standards, 4) learning assessment standards, 5) lecturer and education staff standards, 6) learning facilities and infrastructure standards, 7) learning management standards, and 8) learning financing standards.

Alumnus Competency Standards

Bases on the study from (Sitorus, 2021), alumnus competency standards are minimum criterion regarding on the ability qualifications which include attitudes, knowledge, and skills stated in the formulation of graduate learning outcomes. Graduate competency standards are used as the main reference in the development of Learning content standards, learning process standards, learning assessment standards, Lecturer and Education Staff standards, learning facilities and infrastructure standards, learning management standards, and Learning financing standards. In observing the responses of students and lecturers, they have to answer such as: 1) The learning outcomes formulated in the course already cover all three aspects of the realm of attitudes, knowledge, and skills, 2) In the blended learning process carried out by lecturers able to develop attitudes and behaviors both of spiritual and social life of students, 3) it able to provide knowledge and mastery of concepts, theories, methods, and philosophies in the field of science systematically, 4) it able to provide general work skills in accordance with the type of Department Program, 5) it able to provide uncommon work skills in accordance with the scientific field of the Study Program, and 6) it able to provide work experience in the period of certain time for students.

Bases on 195 students and 63 lecturers’ respondents from several faculties in PGRI University Semarang able to collect the data classified in the following table below.

Table 1. Alumnus Competency Standards

No.	Alumnus Competency Standards	Lecturers (%)	Students (%)
1	Very Inappropriate	0,5	0,9
2	Inappropriate	1,6	3,4
3	Quite Appropriate	18,3	20,7
4	Appropriate	50,8	55,0
5	Fits Perfectly	28,8	20,0
	Total	100,0	100,0

Learning Subject Standards

They have minimum criterion for the level of depth and breadth of learning material that refers to alumnus learning (Kementerian Pendidikan, 2020). In finding out the responses of students and lecturers, they have to answer such as follows: 1) The depth of the material presented in lectures is in accordance with the learning outcomes formulated, 2) The material presented in lectures are able to equip student knowledge, 3) The material presented in lectures able to equip student skills, 4) The material presented in lectures is structured, 5) The scope of the breadth of material presented in lectures is in accordance with the achievements Formulated learning, 6) The

scope of material presented in lectures able to lead students to achieve competence in certain fields both of knowledge and skills in general and theoretical concepts of special parts in the field of knowledge as well as skills widely.

Bases on the research results that has been carried out on respondents are amount 195 student and 63 lecturer respondents from several Faculties in PGRI Semarang University, able to collect the data classified in the following Table 2 below.

Table 2. Learning Subject Standards

No.	Learning Subject Standards	Lecturers (%)	Students (%)
1	Very Inappropriate	0,5	0,9
2	Inappropriate	1,3	2,6
3	Quite Appropriate	7,4	17,2
4	Appropriate	45,8	55,3
5	Fits Perfectly	45,0	24,0
	Total	100,0	100,0

Learning Process Standards

Bases on (Kementerian Pendidikan, 2020) stated that learning process standards are minimum criterion regarding the implementation of learning in study programs to obtain alumnus learning outcomes. Learning process standards include the characteristics of the learning process, learning process planning, implementing the learning process, and student learning load.

In finding out the responses of students and lecturers, they have to answer such as follows:

1) The blended learning process is carried out interactively between lecturers and students, 2) The learning materials provided by lecturers able to instill the values of excellence both of local and national wisdom, 3) The material presented in lectures able to equip students to be able to solve problems through an interdisciplinary or multidisciplinary approaches, 4) Blended learning process carried out in lectures able to realize a conducive academic environment based on religious and national values, 5) The scope of material in the blended learning process is presented in accordance with the demands and developments of science, 6) The scope of material presented in lectures able to provide students with provisions in analyzing factual problems through a transdisciplinary approach, 7) Blended learning process is carried out effectively in accordance with a predetermined time, 8) Blended learning process involves interaction between lecturers and students in order able to develop attitudes, knowledge, and skills in accordance with learning outcomes, 9) Blended learning process provides opportunities of students to develop creativity, independence in observing and finding knowledge.

Bases on the research results that has been carried out on respondents are amount 195 student and 63 lecturer respondents from several Faculties in PGRI Semarang University, able to collect the data classified in the following Table 3 below.

Table 3. Learning Process Standards

No.	Learning Process Standards	Lecturers (%)	Students (%)
1	Very Inappropriate	0,0	0,7
2	Inappropriate	1,6	2,0
3	Quite Appropriate	14,6	17,8
4	Appropriate	51,3	57,8
5	Fits Perfectly	32,5	21,7
	Total	100,0	100,0

Learning Assessment Standards

Bases on (Kementerian Pendidikan, 2020) stated that Learning assessment standards are minimum criterion regarding the assessment of student learning processes and outcomes in order to fulfill alumnus learning outcomes.

In finding out the responses of students and lecturers, they have to answer such as follows:

- 1) Lecturers in conducting assessments complete the principles of good assessment,
- 2) Assessments are carried out by lecturers aim to improve planning and learning methods, as well as achieve alumnus learning outcomes,
- 3) Assessments are carried out by lecturers are oriented to a continuous process and outcomes learnings that reflect student abilities during the learning process,
- 4) The assessment are carried out by the lecturer is based on standards agreed upon with students freed from the influence of subjectivity,
- 5) The assessment is carried out by the lecturer is in accordance with clear procedures and criterion, agreed at the beginning of the lecture, and understood by students,
- 6) The procedures and results of the assessment carried out by lecturers able to be accessed by all stakeholders,
- 7) The lecturer's assessment technique is a combination of observation, participation, performance, written, and oral tests,
- 8) Lecturer applies process assessment in the form of rubrics and assessment results in the form of portfolio or design work,
- 9) Lecturer assesses student affection / attitude in learning.

Bases on the research results that has been carried out on respondents are amount 195 student and 63 lecturer respondents from several Faculties in PGRI Semarang University, able to collect the data classified in the following Table 4 below.

Table 4. Learning Assessment Standards

No.	Learning Assessment Standards	Lectures (%)	Students (%)
1	Very Inappropriate	0,0	0,8
2	Inappropriate	0,7	2,4
3	Quite Appropriate	6,3	18,4
4	Appropriate	46,5	55,1
5	Fits Perfectly	46,5	23,3
	Total	100	100,0

Lecturer And Education Staff Standards

Lecturer and Education Staff Standards are minimum criterion regarding the qualifications and competencies of Lecturers and Education Staff to organize education in order to fulfill alumnus learning outcomes (Kementerian Pendidikan, 2020).

Table 5. Learning Assessment Standards

No.	Lecturer And Education Staff Standards	Lecturer (%)	Students (%)
1	Very Inappropriate	1,2	0,9
2	Inappropriate	1,2	1,8
3	Quite Appropriate	7,2	15,2
4	Appropriate	42,2	54,1
5	Fits Perfectly	48,2	28,0
	Total	100,0	100,0

After the research had been conducted on respondents with the following questions: 1) In the blended learning process, the fields/courses taught by lecturers in accordance with their educational qualifications, 2) In the blended learning process, lecturers have to prepare learning materials arranged, 3) In the blended learning process, lecturers are mastering the learning material well, 4) In blended learning, lecturers able to apply learning media appropriately, 5) In the blended learning process, lecturers able to utilize learning strategies/models that are relevant to the teaching material, 6) In the blended learning process, lecturers able to utilize appropriate assessment tools in accordance with the material taught, 7) Education Staffs (other than Administrative Staffs) should have minimum academic qualifications background of diploma 3 (three) program stated with an attest document in accordance with the qualifications of their main duties and functions, 8) Administration Staffs should have minimum academic qualifications background at least from Senior High School or equivalent, 9) Education Staffs who require special skills have a certificate of competence in accordance with their field of duty and its expertise.

Bases on the questions above, researchers conducted research in PGRI Semarang University with respondents from several faculties in PGRI Semarang University obtained the following data (Table 5).

Learning Facilities and Infrastructure Standards

The standard of facilities and infrastructure according to (Kementerian Pendidikan, 2020) mentioned that minimum criterion regarding facilities and infrastructure in accordance with the content and learning process necessity in order to reach alumnus learning outcomes.

After conducting research on respondents with the following questions; 1) Blended learning lecture media used by lecturers are easily accessible to students, 2) Internet facilities (bandwidth) are sufficient for blended learning lectures, 3) The available E-Learning software is suitable to support blended learning lectures, 4) The available of E-Learning software is easily accessible to students, 5) The E-Library is easily accessible to students, 7) Laboratory materials, equipment, and facilities are sufficient to support lecture’s practicum, 8) Materials, equipment, and laboratory facilities are easily accessible to students.

Bases on the questions above, researchers conducted research in PGRI Semarang University with respondents from several faculties in PGRI Semarang University obtained the following data (Table 6).

Table 6. Learning Facilities and Infrastructure Standards

No.	Learning Facilities and Infrastructure Standards	Lecturers (%)	Students (%)
1	Very Inappropriate	0,4	1,0
2	Inappropriate	2,3	3,4
3	Quite Appropriate	10,9	23,9
4	Appropriate	48,8	50,4
5	Fits Perfectly	37,6	21,3
	Total	100,0	100,0

Learning Management Standards

Bases on (Kementerian Pendidikan, 2020), mentioned that the definition of learning management standards is a minimum criterion regarding planning, implementing, controlling, monitoring and evaluating, and reporting Learning activities at the Department Program level.

After conducting research on respondents with the following questions; 1) do your courses that you teach are equipped with learning tools (Syllabus/RPS)?, 2) does the course material that you test is in accordance with the course material taught?, 3) have lecturing academic atmosphere been achieved well?, 4) have the curricula in UPGRIS always been updated?, 5) is the Semester Lecture Plan (RPS) is available in the Lecture Information System (SIP)?, 6) are you being objective in providing course values?, 7) does the learning management in UPGRIS manage well?

Bases on the questions above, researchers conducted research in PGRI Semarang University with respondents from several faculties in PGRI Semarang University obtained the following data:

Table 7. Learning Facilities and Infrastructure Standards

No.	Learning Management Standards	Lecturers (%)	Students (%)
1	Very Inappropriate	0,7	0,5
2	Inappropriate	0,5	2,0
3	Quite Appropriate	5,9	16,3
4	Appropriate	42,1	55,7
5	Fits Perfectly	50,8	25,5
	Total	100,0	100,0

Learning Financing Standards

According to (Kementerian Pendidikan, 2020), mentioned that the definition of learning financing standards is a minimum criterion regarding the components and amount of investment as well as operational costs prepared in order to fulfill alumnus learning outcomes.

After conducting research on respondents with the following questions; 1) does University provide adequate IT access for blended learning? 2) does University invest budget for E-Learning / blended learning purposes, 3) has the operational costs being allocated by universities for blended learning are sufficient? 4) has University operational costs being fulfilled the adequacy ratio for blended learning?

Bases on the questions above, researchers conducted research in PGRI Semarang University with respondents from several faculties in PGRI Semarang University obtained the following data:

Table 8. Learning Financing Standards

No.	Learning Financing Standards	Lecturer (%)	Students (%)
1	Very Inappropriate	0,0	1,1
2	Very Inappropriate	1,2	3,4
3	Quite Appropriate	15,9	24,1
4	Appropriate	57,9	54,2
5	Fits Perfectly	25,0	17,2
	Total	100,0	100,0

Conclusion

Bases on the research results that has been carried out shows that the competency standards of alumnus in the blended learning lecturing process in PGRI Semarang University show several indicators as follows: The learning outcomes formulated in each subject already include aspects of student attitudes, knowledge, and skills; The blended learning process carried out by lecturers able to be categorized into the following findings: being able to cultivate attitudes and behaviors in the spiritual and social life of students; Providing knowledge and mastery of concepts, theories, methods, as well as philosophies in accordance with the field of science systematically; Providing general employability tailored to each study program; Providing special work skills in accordance with the scientific field of the study program; Providing work experience to students for a certain period of time.

In addition, referring to the study from (Shamsuddin & Kaur, 2020) mentioned that the elaboration of learning content standards in the blended learning lecture process in PGRI Semarang University is as follows: The depth of material provided by lecturers during lectures has been adjusted to the learning outcomes that have been formulated. The material presented in blended learning lectures able to be a reference for students which includes the following: providing student knowledge; Being able to equip student skills; the elaboration of the material is arranged in a structured manner; The breadth of the material is sufficient to be presented in lectures in accordance with the learning outcomes of blended learning; The scope of material is appropriate to be presented in blended learning lectures that able to lead students achieving competence in certain areas of knowledge and skills both in general and theoretical concepts of special parts in the field of knowledge and skills considerable.

Referring to the study from (Suartama et al., 2019) mentioned the technology information has a crucial role regarding to this blended learning process as a technology information utilization. The research results that have been carried out show that learning process standards in the blended learning lecture process in PGRI University Semarang is classified into as follows: The blended learning process has been carried out interactively between lecturers and students; The blended learning materials provided by lecturers are sufficient to instill the values of excellence both of local and national wisdoms; The material presented in blended learning lectures able to equip students to be able to solve problems through an interdisciplinary or multidisciplinary approaches. The blended learning process carried out in lectures able to create a conducive academic environment based on

religious and national values; The scoop up material in the blended learning process is well to be presented with the demands and developments of science.

According to the study from (Rabiu et al., 2023) mentioned that the material presented in lecturing activity is sufficient to equip students in analyzing factual problems through a transdisciplinary approach; The blended learning process carried out is effective in accordance with the predetermined time. The blended learning process carried out is efficient in accordance with the predetermined time. The blended learning process has provided opportunities for students to develop creativity, independency in observing and finding knowledge; Lecturers have prepared blended learning materials very well; The lecture able to mastering blended learning activity, Lecturers are very familiar with the lecture material. During the blended learning lecture process, Lecturers able to apply learning media appropriately; in the blended learning process, Lecturers able to utilize learning strategies / models that are relevant to the teaching material.

Referring to the study from (Kristanto et al., 2017) showed the development in E-Learning become a global issues due to the online study condition affected by covid 19 pandemic, therefore learning assessment standards in the blended learning lecture process in PGRI Semarang University are classified into follows: Lecturers in conducting assessments fulfill the principles of good assessment; The assessment carried out by lecturers has aimed to improve planning and learning methods, as well as to achieve graduate learning outcomes; The assessment carried out by lecturers is oriented towards a continuous learning process and learning outcomes that reflect student abilities during the learning process; The assessment carried out by lecturers is based on standards agreed upon with students and being neutral from the influence of subjectivity.

The assessment carried out by lecturers is in accordance with obvious procedures and criteria, agreed at the beginning of the lecture, and understood by students; The procedures and results of assessments carried out by lecturers able to be accessed by all stakeholders; The assessment techniques used by lecturers are a combination of observation, participation, performance, written and oral tests; Lecturers simply apply process assessment in the form of rubrics as well as assessment results in the form of portfolios or design works; Lecturers have assessed students' affection/attitudes in learning; In the blended learning process, Lecturers able to utilize appropriate assessment tools in accordance with the material subjected.

According to the study from (Gleadow et al., 2015) mentioned that the development of subject material has to create according to the environmental standards in order able to increase the lecture presentation and student's understanding in face- to face class. The standards of lecturers and educational staff in PGRI Semarang University are classified into the following stages: Lecturers have educational qualifications in accordance with the field of study/course in the blended learning process; Education Staffs (other than Administration Staffs) in PGRI Semarang University already has minimum graduated academic qualifications of diploma 3 (three) programs stated with attest document in accordance with the qualifications of their main duties and functions; Administration staff in PGRI Semarang University already have academic qualifications at least graduated from Senior High School or equivalent; Education staffs who require special skills already have a certificate of competence in accordance with their field of duty and expertise.

In the blended learning process, standard facilities and infrastructure are needed in order able to support the process of these activities, in addition in PGRI Semarang University has several criterion as follows: The blended learning lecture media used by lecturers is very accessible to students; The internet (bandwidth) facilities in PGRI Semarang University campus are good to support blended learning lectures; The E-Learning software available in PGRI Semarang University is fulfilled to support blended learning courses and being easily accessible to students; The E-Library in PGRI Semarang University is easily accessible to students; Materials, equipment, and laboratory facilities in PGRI Semarang University are sufficient to support practicum lectures as well as is easily accessible to students.

According to the research results that has been carried out, it shows that the standards for learning management within PGRI Semarang University are as follows: All courses in blended learning are equipped with learning tools; The lecture material taught by lecturers during blended learning is in accordance with what was tested; The academic atmosphere in PGRI Semarang

University is good; The curricula in PGRI Semarang University is always updated according to the needs of the times; The Semester Lecture Plan (RPS) for each course is available in the Lecture Information System (SIP); The assessment carried out by lecturers in blended learning is objective; Learning management in PGRI Semarang University has been well managed; PGRI Semarang University has provided access to adequate Information Technology services for blended learning.

In addition, the research results that have been carried out show that learning financing standards within PGRI Semarang University are categorized into the following stages: PGRI Semarang University has provided access to adequate Information Technology services for blended learning and facilitates the needs of E-Learning or blended learning; The operational costs allocated by PGRI Semarang University are sufficient for blended learning; The operational cost ratio of PGRI Semarang University has fulfilled the ratio of blended learning necessity. The blended learning lecture process carried out in PGRI Semarang University has been carried out well and in accordance with national higher education standards referring to (Kementerian Pendidikan, 2020).

Funding: This research received no external funding.

Conflicts of Interest: The authors declare that no potential conflicts of interest in publishing this work. Furthermore, the authors have witnessed ethical issues such as plagiarism, informed consent, misconduct, data fabrication, double publication or submission, and redundancy.

References

- Cortini, M. (2014). Mix-method research in applied psychology. *Mediterranean Journal of Social Sciences*. <https://doi.org/10.5901/mjss.2014.v5n23p1900>
- Creswell, J. W. & J. D. C. (2018). *Research Design Qualitative, Quantitative, and Mixed Methods Approaches Fifth Edition*. Sage Publications, Inc.
- Gleadow, R., Macfarlan, B., & Honeydew, M. (2015). Design for learning - a case study of blended learning in a science unit. *F1000Research*. <https://doi.org/10.12688/f1000research.7032.2>
- Kementerian Pendidikan. (2020). Peraturan Menteri Pendidikan Dan Kebudayaan Republik Indonesia Nomor 3 TAHUN 2020 Tentang Standar Nasional Pendidikan Tinggi (p. 76). <https://usd.ac.id/lembaga/lpmai/wp-content/uploads/2021/04/Permendikbud-Nomor-3-Tahun-2020.pdf>
- Kristanto, A., Mustaji, M., & Mariono, A. (2017). The Development of Instructional Materials E-Learning Based On Blended Learning. *International Education Studies*. <https://doi.org/10.5539/ies.v10n7p10>
- Pendidikan, K. K. (2020). Mendikbud Terbitkan SE tentang Pelaksanaan Pendidikan dalam Masa Darurat Covid-19. *Kemdikbud*.
- R. Burke Johnson, University of South Alabama; Larry Christensen, USA. (2014). *Educational Research Quantitative, Qualitative, and Mixed Approaches Fifth Edition (Fifth edit)*. Sage Publications, Inc. https://ismailsunny.files.wordpress.com/2017/07/educational-research_-quantitat-r-roburt-burke-johnson.pdf
- Rabiu, A., Hameed Ishola, S., & Ajelabi, P. A. (2023). A Review of Blended e-Learning Materials Model Designs and its Application for Tertiary Institutions Students' Use. *International Journal of Education Humanities and Social Science*. <https://doi.org/10.54922/ijehss.2023.0526>
- Shamsuddin, N., & Kaur, J. (2020). Students' learning style and its effect on blended learning, does it matter? *International Journal of Evaluation and Research in Education*. <https://doi.org/10.11591/ijere.v9i1.20422>
- Sisilia, H. S., Astuti, R. S., Priyadi, B. P., Herawati, A. R., & Afrizal, T. (2022). Strategi Pembelajaran di Masa Pandemi Covid-19 pada Satuan Menengah di Provinsi Jawa Tengah. *Perspektif*. <https://doi.org/10.31289/perspektif.v11i3.6275>
- Sitorus, T. M. (2021). Penyelarasan ISO 21001:2018 Dengan Peraturan Standar Nasional Pendidikan Tinggi Nomor 3 Tahun 2020. *JAS-PT (Jurnal Analisis Sistem Pendidikan Tinggi Indonesia)*. <https://doi.org/10.36339/jaspt.v5i2.524>
- Suartama, I. K., Setyosari, P., Sulthoni, & Ulfa, S. (2019). Development of an instructional design model for mobile blended learning in higher education. *International Journal of Emerging Technologies in Learning*. <https://doi.org/10.3991/ijet.v14i16.10633>
- Sugiyono. (2014). *Metode Penelitian Kuantitatif, Kualitatif dan R&D*. Alfabeta.



© 2024 by the authors. Submitted for possible open access publication under the terms and conditions of the Creative Commons Attribution (CC-BY) license (<http://creativecommons.org/licenses/by/4.0/>).

Aims & Scope (Economics)

Article

MAXIMIZING FARMER'S INCOME IN ALBANIA: EXPLORING THE IMPACT OF COOPERATIVES IN AGRICULTURE

Denisa Kurtaj,

Agricultural University of Tirana, Faculty of Economy and Agribusiness,
Department of Agribusiness Management
<https://orcid.org/0009-0006-5896-1156>

Received: 19 February 2024; Accepted: 29 February 2024; Published: 10 March 2024

Abstract. Vegetable farming is a highly intensive production operation that requires significant investments. Although it can provide high levels of profits, recent developments have shown that actual profitability margins for vegetable growers are low due to several reasons such as low yield level, high production costs, lack of partnership in producer-buyer relations, limited access to agricultural input markets, and high prices for consumers. Studies have shown that there are different options for selling vegetable products in the market. While some farmers sell their products on the street, most of the vegetable producers use more than one alternative for selling their produce. A large number of farmers sell their products in local markets, to wholesalers, and in some cases to exporting companies. Furthermore, studies show that vegetable producers earn about 20 All from their activity on the farm, while other actors in the supply chain earn about 35 All for operations like transport, storage, etc., which are performed for a short period of time. The length of this supply chain and the significant number of actors involved in it are major problems for vegetable producers. They are not part of the supply chain, and horizontal cooperation between them is necessary. Through this type of cooperation, farmers become active participating actors in this supply chain, with all the benefits that derive from it.

Keywords: supply chain, vertical integration, horizontal cooperation.

Citation: Denisa Kurtaj. (2024). MAXIMIZING FARMER'S INCOME IN ALBANIA: EXPLORING THE IMPACT OF COOPERATIVES IN AGRICULTURE. *Conferencii*, (8) 2. http://doi.org/10.51586/Conferencii_8_2_2024

Introduction

The agriculture sector plays a vital role in the economy of most developing countries. However, its contribution has been decreasing over the years, and it is estimated to be around 18.63% of the GDP in 2022. More than half of the population lives in rural areas, and agriculture is the primary source of income for them. Although there has been an increase of around 3% per year in agriculture production during the last five years, small-sized farms and farmland fragmentation remain major barriers to production and marketing. The growth of the agriculture sector is below the national average and far from its potential. The sector faces several challenges, including migration from rural areas, limited land ownership and small farm sizes, difficulties in product marketing, outdated irrigation and drainage systems, obsolete technologies, weak farmer organizations, and insufficient agro-processing capabilities. The government has implemented various policies to increase agricultural production. These policies include irrigation development, production input subsidies, farm credit, and institutional development.

Vegetable farming is a highly intensive operation that requires significant investment from producers. While the profits in this industry are high, recent developments have revealed that actual profitability margins for vegetable growers are low. This is due to a number of factors such as low yield levels, high production costs, limited access to agricultural input markets, lack of partnership in producer-buyer relations, and higher prices for customers. It is worth noting that these challenges apply to both open and protected environments, such as greenhouses of various types, although profits are generally higher in greenhouses.

Literature Review

The agriculture sector is a very important sector in the economy of most developing countries as one of the economic sectors which are a source of income for workers with an estimated 60 to 70 percent in developing countries (Nguyen et al., 2015). One of the role of the agricultural sector as meeting basic needs or food, the increasing population will automatically make food consumption will also increase so as to improve the economy for farmers. Improving agricultural productivity should be a priority. This can be achieved by enhancing agricultural technology and management, including groundwater and post-harvest management.

This means that changes in the production structure moved far ahead of those in the implement structure of the workforce. Though productivity is generally considered as the most important determinant of competitiveness, it is not to be taken for granted that if one country produces at a lower cost than another country, that country can sell in the other country's market (Skreli., et al 2009). The ratio of worker productivity in agriculture to non-agriculture is registering a decline despite widespread application of improved farm technology in agriculture (Dr. Rabi N. Patra., et al 2013). In spite of remarkable GDP growth and substantial diversification in production structure at the macro level in recent years, little has changed in the villages. Rob Lawson et al., (2008) conducted a study in New Zealand to see how farmers create value through cooperation. They found that over 80 per cent of the traders at the markets were involved in some form of cooperative activity, reinforcing the idea of markets as community-based activities with high levels of interdependence amongst participants. Cooperation could be identified in different categories and increased over the length of time of trading at the market but could not be directly related to performance or the reasons traders offer for doing business at the market. A survey of farmers' market members was undertaken and findings are reported with descriptive statistics and exploratory analysis to profile aspects of cooperation amongst stallholders. The categorization of cooperation methods offers traders ways in which they might seek to more formally organize joint efforts.

The cooperative company is just one of the many institutions by which society organizes economic activities in the most practice and efficient way. The main points of departure in a cooperative organization are that membership is voluntary and open to all and that it produces services in the interests of its members (Samuli Skurnik, 2002). The cooperative form of company and entrepreneurship is in extensive use throughout the world. Today, cooperation has an important social role to play in the organization of economic relations.

Methods

The main objective of the study would be to understand and evaluate the current situation of the agro-processing industry in such a context as to analyse the issues facing the strategic leadership, seeing it from the perspective of the strategy of vertical integration and horizontal cooperation as well. Furthermore, it intends to bring out and evaluate the role of all the actors that figure in the chain of values. Based on this chain of values, conclusions might be formulated around the strategies that might be utilized to stimulate internal cooperation and build partnerships through the organization and functioning of clusters.

On the benefit of realizing the objectives of this study are developed two questionnaires, one with vegetable farm managers and one with managers of processing and conserving industry. In the centre of this study was the identification and analyse of different variables on the benefit of creating strategies of improving management of value chain in the vegetable filiere, increasing the role and participation of farmers on it.

Results and Discussion

Over the last ten years, there has been little to no change in the structures of vegetable production. This is due to the fact that vegetable producers are uncertain about introducing new production structures and garden plants, as they lack sufficient knowledge about them.

Survey results show that as to this period the plants cultivated in dense vegetation are tomatoes and pepper¹. According to the survey results, out of the 24 hectares of vegetables planted (sample study), tomatoes make up approximately 73% of the total area, while the species of pepper

constitute only about 5% of the area. Together, tomatoes and peppers make up 78% of the total area. The survey results confirm this assertion, which is evident from the chart data provided below. We believe that it is necessary to further diversify the vegetable production structure, especially with regards to certain types of garden plants that have market demand and whose added value is increasing.

As part of a study, I was interested in learning about the future trends in vegetable production. In order to do so, we asked vegetable producers if they believed that the production structure would change by 2023. The results showed that approximately 56% of the interviewees answered yes. This indicates that vegetable producers, especially those who grow plants in greenhouses, have been experimenting with incorporating a variety of other garden plants into their production structure, including those that were previously less or never cultivated.

It is worth noting that vegetable production has been on the rise in recent years. When it comes to constructing production structures, it is crucial to know who should advise farmers and where to seek advice. As a result, farmers were asked about the source of information they received regarding the construction of vegetable structures. The survey results are as follows (Fig. 1).

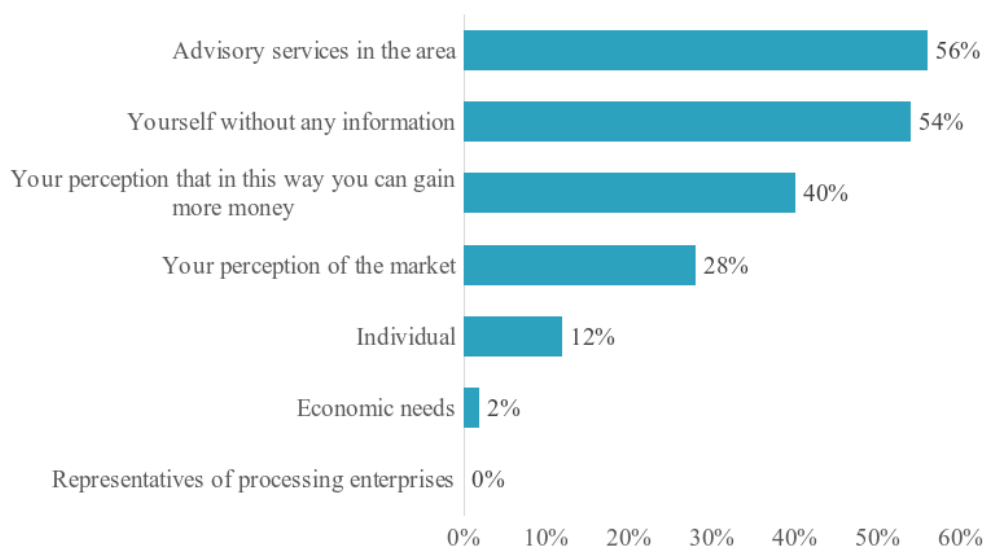


Figure 1. The information regarding the construction of production facilities for vegetable producers

Based on the data provided, it can be concluded that vegetable producers rely on various sources of information when constructing production structures. The local advisory service is the most commonly used source of information, with 54% of the producers doing it themselves and 56% seeking assistance from the local advisory service. It is important to note that producers have limited knowledge about the market, as only 28% of respondents based their decisions on market information when constructing their production facilities. The fig. 1 also shows that none of the respondents had been in contact with processing enterprise industry representatives, which indicates that vertical integration with back direction is difficult to achieve. This could pose a problem in providing safe markets for vegetable producers.

Production is undoubtedly the main component of the vegetable supply chain. However, the chain cannot be considered complete without taking other links into account, through which the product passes before it reaches the end consumer. In light of this, the respondents were asked whether they had received any consultation on vegetable treatment and, if so, by whom.

The data above shows that around 47% of respondents have consulted local advisory services while 38% have sought help from different experts. In Albania, the distribution of production, especially vegetables, faces many challenges (Fig. 2).

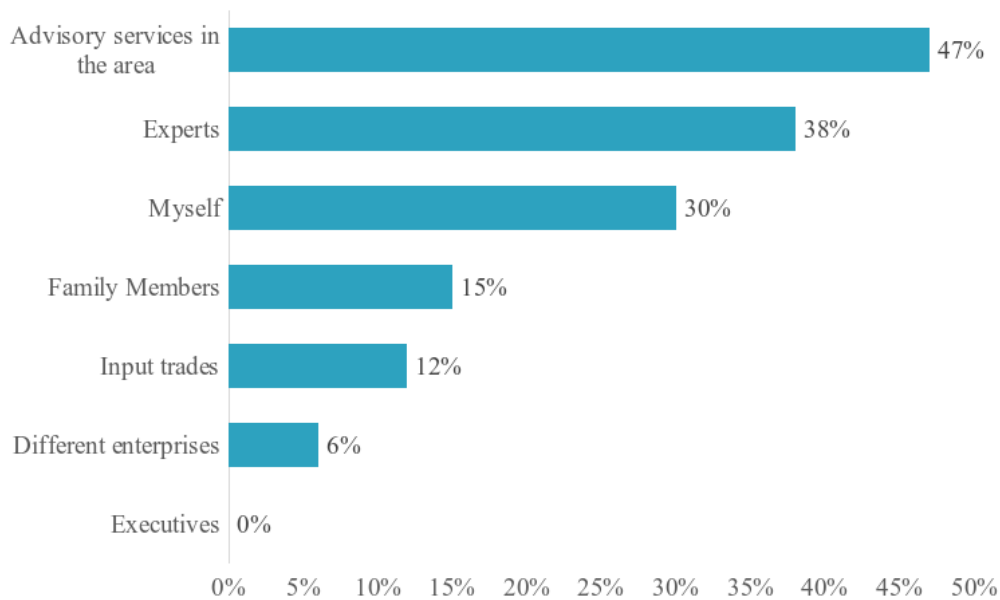


Figure 2. Information about consultancy services for the treatment of vegetables

To understand this situation better, the participants were asked if they have ever contacted any third-party for vegetable sales and the quantity sold through these channels. The survey results are as follows:

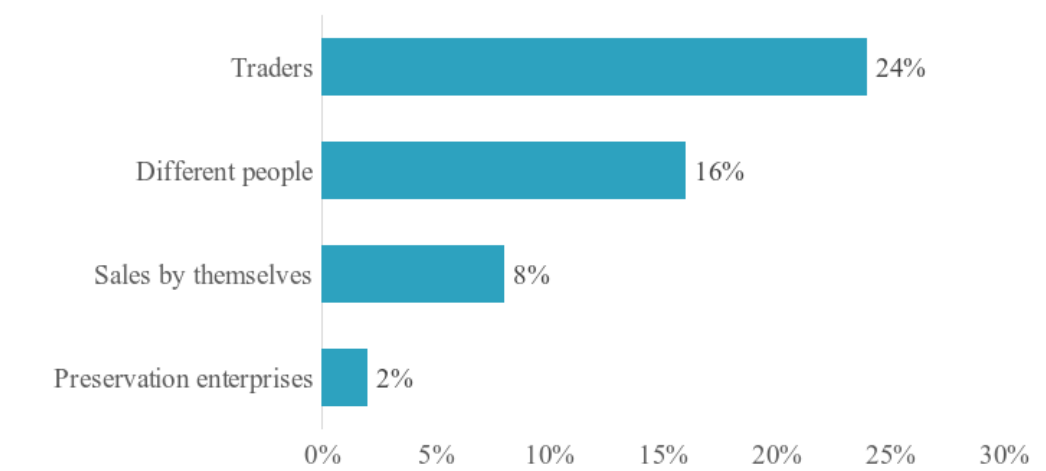


Figure 3. Information about contacts with the third party

Based on the data presented in Fig. 3, it is evident that some of the respondents did not answer the question. Among those who did respond, around 24% of them had contacts with different traders, while 16% of vegetable producers had informal contacts with different people. It is noteworthy that in such informal contacts, the contract system did not seem to be effective.

The methods used for selling vegetables are undoubtedly a crucial element in improving management in the supply chain. To address this issue, the participants were asked a series of questions. The table below shows the questions asked during the interview.

From the above data, it is evident that around 82% of respondents have confirmed that they sold their products in the market themselves. This is connected with wholesale markets that exist in multiple districts of the country. However, it is important to note that we are mainly referring to vegetable producers in greenhouses and not producers in open fields. Despite this, even in the case of selling their produce, producers are facing various challenges due to the lack of cooperation among themselves, fragmentary supply, absence of partnership among producers in markets, etc. These challenges are affecting their profitability levels.

It was found that only 14% of agro-industry companies purchase vegetables directly from the producers (Fig. 4).

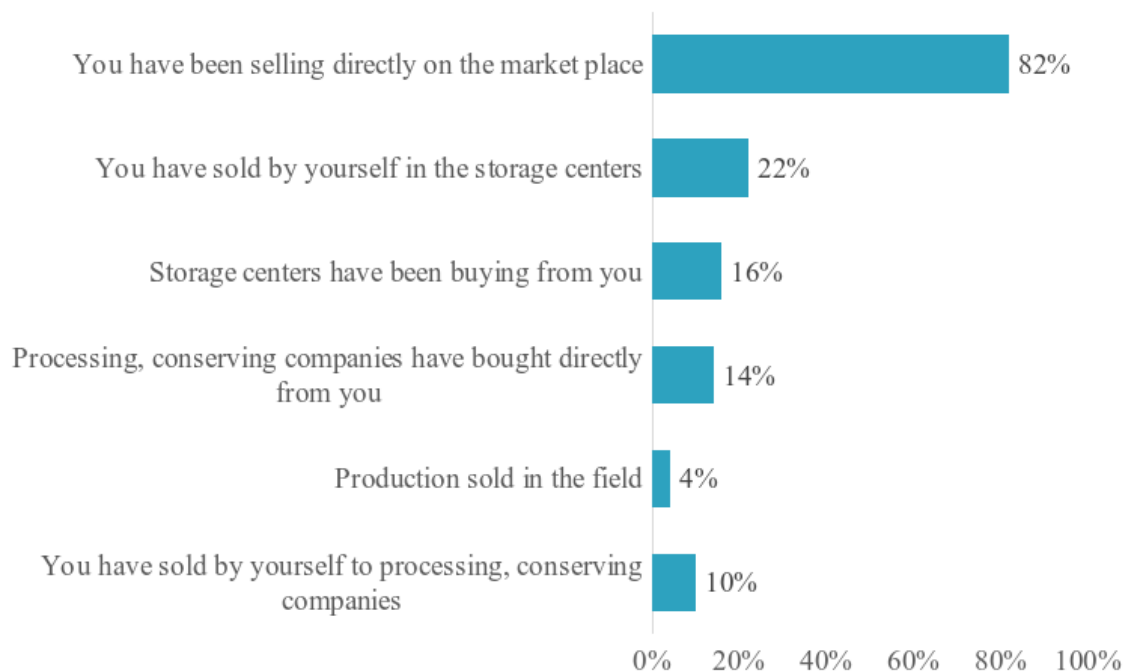


Figure 4. Information about the alternatives available for selling vegetable production

Additionally, there is a lack of communication and collaboration between the vegetable producers and the processing and conservation industry. Based on these findings and the data presented in the table, we can conclude that:

- Vegetable processors believe that it is more profitable for them to import raw materials for processing instead of sourcing them locally.
- National statistics indicate that approximately 40% of the raw materials used in the vegetable processing industry are imported.
- Unfortunately, the current contractual links between vegetable producers and processing and conservation industries are not functioning properly. This has resulted in a severe lack of information available to vegetable producers.
- As a result, they are not considered as partners in the markets due to the low level of cooperation.
- Additionally, the effectiveness of supply chain management in improving the situation is very low.

After analyzing the responses of the participants regarding their methods of selling products in the market, we can draw a general conclusion represented in Annex's Fig. 6, which shows the value-added supply chain in the study region.

As depicted in Fig. 6, there are various options available for farmers to sell their produce in the market. It is evident that a small number of farmers sell their products on the street. However, this kind of sale is not recommended since it is mainly for farmers who produce limited quantities for their own consumption. Most vegetable producers use multiple channels to sell their products. For instance, a significant number of farmers who were interviewed sell their produce in local markets, to wholesalers, and in special cases, to exporting companies.

Let's analyze the positive and negative characteristics of different ways of selling tomatoes based on production data.

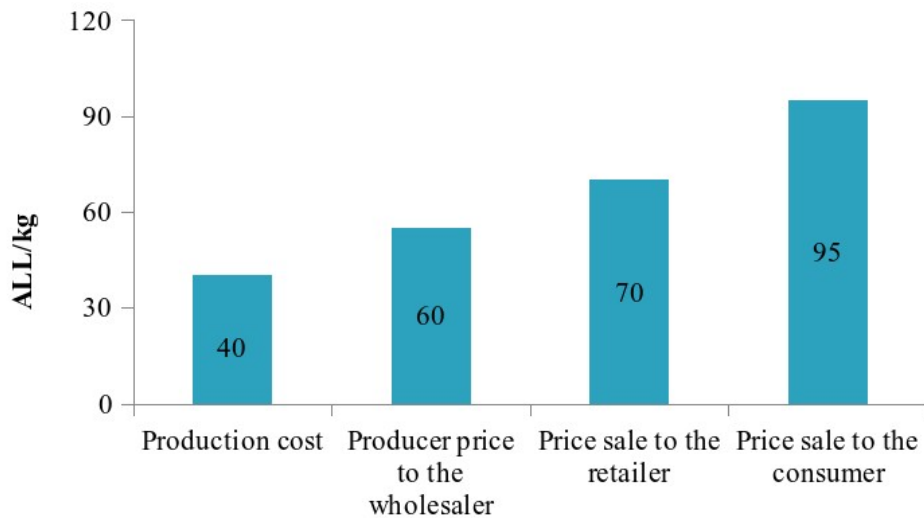


Figure 5. Information about the alternatives available for selling vegetable production

Based on the data presented in Fig. 5, it is evident that vegetable producers earn approximately 0.18 EUR/kg or 20 ALL/kg (60-40) from their farm activities. On the other hand, other participants in the supply chain earn roughly 0.33 EUR/kg or 35 ALL/kg (95-60) for their services such as transportation, storage, etc., which are performed for a short duration. Therefore, it is apparent that the number of actors involved in the supply chain and its length is a significant issue for vegetable producers.

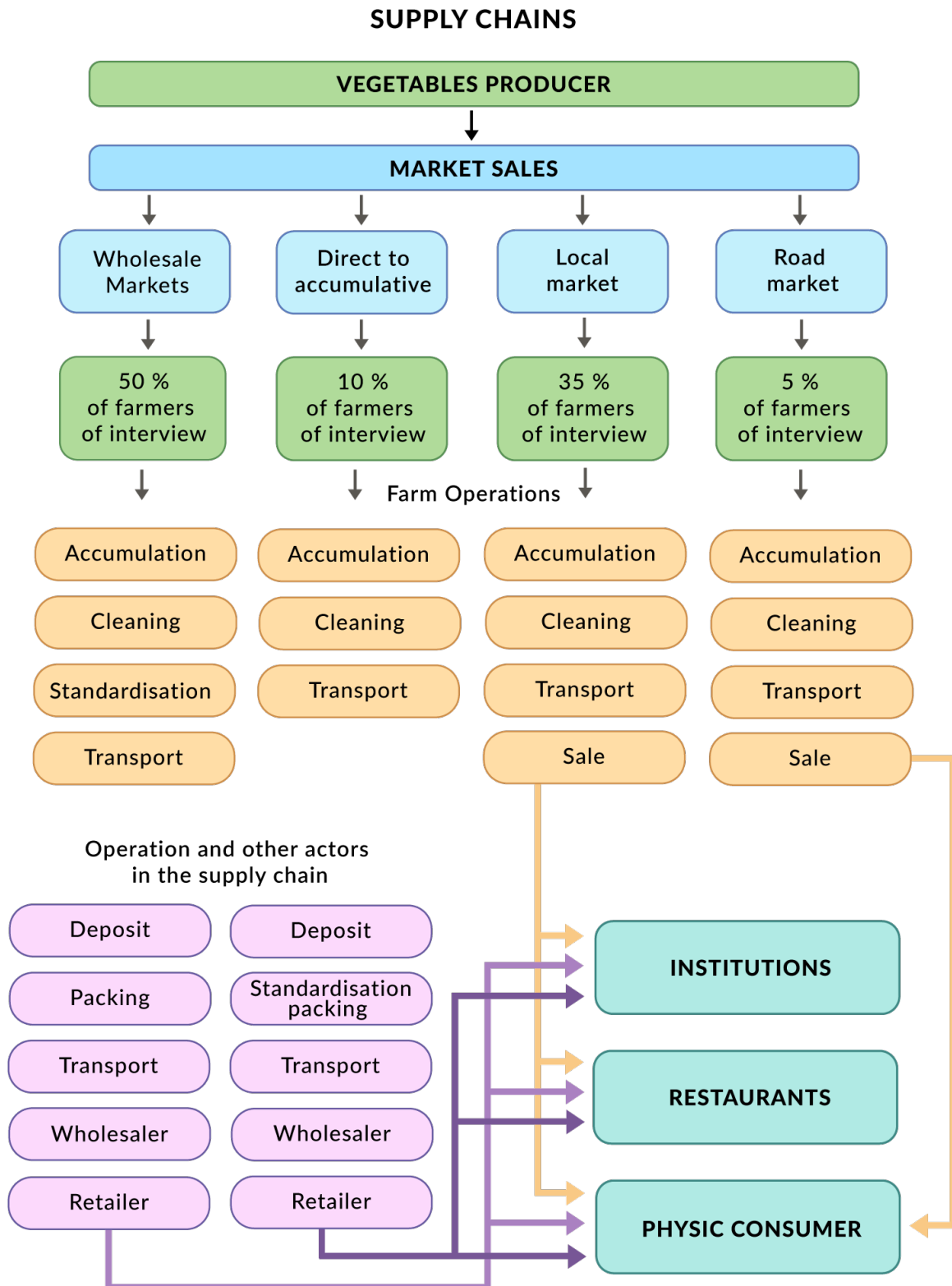


Figure 6. Value added supply chain in the study area

After analyzing the above comments and evaluating the business environment in Albania, we conclude that the vegetable supply chain should follow the diagram in Fig. 7 (Vegetable Supply Chain) as shown in the annex.

Based on the information provided in Fig. 7 and the comments given above, it is evident that the role of wholesalers is being fulfilled by marketing co-operatives of vegetable producers. When

farmers become members of a cooperative, they become active participants in the value chain and are able to enjoy all of the benefits that come with it.

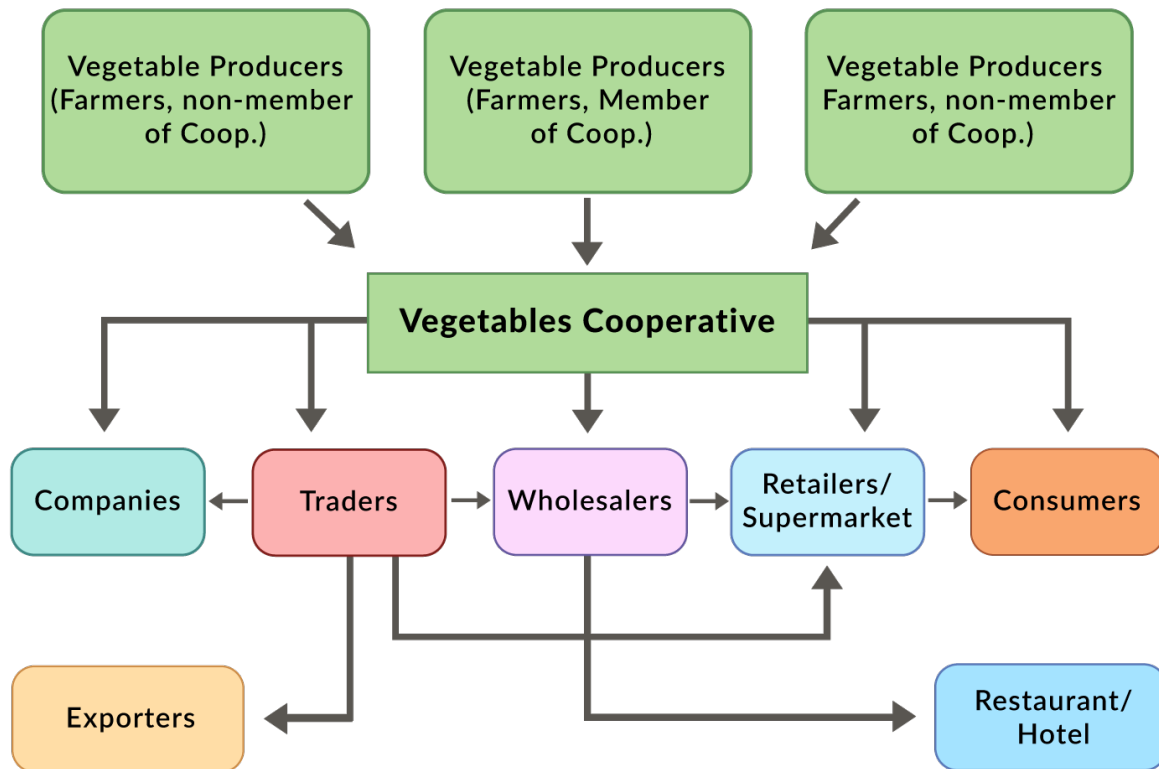


Figure 7. Vegetable supply chain

Based on the strategies proposed, we believe that organizing vegetable producers into supply and marketing cooperatives is advantageous for increasing the added value of their products. Additionally, this helps ensure that vegetable producers have control over the added value of their products.

If we take into account the various levels of value added along the value chain that exclude production, we can infer that joining a cooperative as a vegetable producer would be a highly profitable alternative. This is especially true for vegetable producers as it helps to streamline the value chain by eliminating intermediaries. We would like to highlight the advantages of this integration type, including enhanced partnership among vegetable producers in the market, better control over various links in the value chain, and increased economic benefits for vegetable producers.

The claims made above are based on the idea that cooperatives act as a connecting point between producers and retailers, as shown in Fig. 8 (The Purchase-Sale Relationship for Fresh Vegetables: The Role of the Cooperative), which can be found in the annex. The information provided in Fig. 8 illustrates how the purchase and sale relations between producers, cooperatives and retailers are organized. It also explains the role played by cooperatives in improving the cooperation between actors, the concentration of the offer, and other related areas. The role of cooperatives in improving supply chain management is also suggested for other reasons. As previously mentioned, it is crucial for retailers to establish stable relationships with their primary suppliers. This is because suppliers can vouch for the safety and quality of the products that they provide, while traders may not be able to guarantee the same level of quality and safety. This is due to the fact that traders typically purchase from multiple manufacturers, which can lead to variations in product quality.

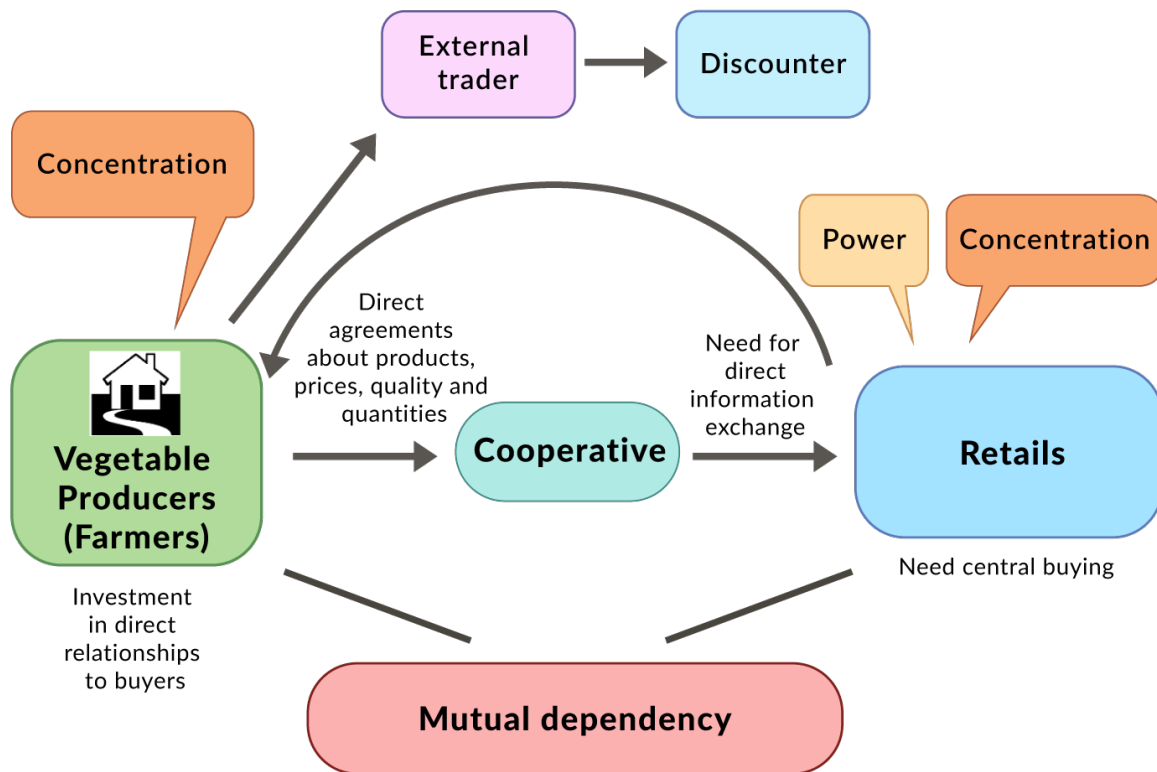


Figure 8. The Purchase-Sale Relationship for Fresh Vegetables: The Role of the Cooperative

We do not consider wholesale as a viable strategy for selling fresh vegetables to major supermarkets in today's markets. Retailers cannot afford the expenses of going to wholesale markets and purchasing small quantities of products from different suppliers. Therefore, a streamlined value chain is necessary, and cooperatives can play a crucial role in this. It is evident that the objective in this scenario is to increase market power. However, this move also affects non-cooperative producers who are given two options for distributing their products. They can either enter into a special commercial agreement with wholesalers or use the cooperative to sell their merchandise.

Conclusion

Prior to the 1990s, Albania had a strong vegetable production industry. However, after the 90s, the industry experienced a significant decline in production. This situation had a negative impact on the vegetable production structures and related areas. Unfortunately, for almost a decade, there was little or no change in the production structure.

The phenomenon is mainly related to the uncertainty of the vegetable production sector in introducing vegetable plants that they have little knowledge about. Greenhouse vegetable producers have tended to involve a great number of other vegetable plants in their production structures, some of which are less or not at all cultivated.

Based on survey data, vegetable producers rely on various sources of information when creating production structures. The most important source of information tends to be consulting services in the area.

It's worth noting that few producers base their construction of production structures on market information due to their lack of knowledge about the market.

The methods used to sell vegetables are undoubtedly an essential factor in addressing the challenges related to improving the supply chain. However, there are limited connections with businesses in the processing and preservation industry. Additionally, only a small number of agro-industry companies are interested in buying directly from the producers.

Many vegetable producers use multiple channels to sell their products. For instance, a significant number of farmers interviewed sell their produce directly in local markets, wholesale markets, and occasionally to exporting companies.

To expand the range of products, it is essential to diversify the vegetable production structure. This is especially important for vegetable plants that are in high demand and can increase in value.

Funding: This research received no external funding.

Conflicts of Interest: The author declare no conflict of interest.

References

- Putu Irvan, Ni Nyoman Yuliarmi. (2019). Analysis of Impact Factors on Farmers Income, *International Research Journal of Management, IT & Social Sciences*, Vol. 6 No. 5, 218-225. <https://doi.org/10.21744/irjmis.v6n5.731>
- Nguyen, A. T., Dzator, J., & Nadolny, A. (2015). Does contract farming improve productivity and income of farmers?: A review of theory and evidence. *The Journal of Developing Areas*, 49(6), 531-538, <https://doi.org/10.1353/jda.2015.0094>
- Dr. Rabi N. Patra, Mahendra P. Agasty. (2013). Cooperatives, Agriculture and Rural Development: Role, Issues and Policy Implications, *IOSR Journal Of Humanities And Social Science (IOSR-JHSS)*, Volume 13, Issue 2, p. 14-25. <https://www.iosrjournals.org/iosr-jhss/papers/Vol13-issue2/C01321425.pdf?id=1547>
- Engjell Skreli, Catherine Chan Halbrendt and Astrit Balliu. (2009). Competitiveness of Albanian Agriculture: Value Chain Analysis for Fruits and Vegetables Sub-Sector in Fier Region, https://www.ifama.org/resources/files/2009-Symposium/1195_paper.pdf
- Lawson, R., Guthrie, J., Cameron, A., Fischer, W. (2008). Creating value through cooperation? An investigation of farmers' markets in New Zealand. *British Food Journal*. 110(1). pp. 11-25. <http://dx.doi.org/10.1108/00070700810844768>
- Samuli Skurnik. (2002). The Role of Cooperative Entrepreneurship and Firms in Organising Economic Activities - Past, Present and Future, *The Finnish Journal of Business Economics*, p. 103-124. http://lta.lib.aalto.fi/2002/1/lta_2002_01_d6.pdf



© 2024 by the authors. Submitted for possible open access publication under the terms and conditions of the Creative Commons Attribution (CC-BY) license (<http://creativecommons.org/licenses/by/4.0/>).

Aims & Scope (Economics)

Article

INFORMATION PROCESSES IN MODERN ENTERPRISE MANAGEMENT IN THE SYSTEM OF VIRTUAL ECONOMY

Kateryna Molchanova,

National Aviation University, Ukraine

<https://orcid.org/0000-0003-1846-2492>

Kostiantyn Olefirenko,

Kyiv National University of Technologies and Design, Ukraine

<https://orcid.org/0009-0007-3930-2515>

Grygoriy Shamborovskyi,

Ivan Franko National University of Lviv, Ukraine

<https://orcid.org/0000-0003-2284-0542>

Iryna Kyrchata,

Kharkiv National Automobile and Highway University, Ukraine

<https://orcid.org/0000-0002-0270-1586>

Received: 23 February 2024; Accepted: 29 February 2024; Published: 14 March 2024

Abstract. The developed methodological recommendations regarding the formation of a range of scenarios for the development of industrial enterprise activity, taking into account the indicators of enterprise management information processes based on the construction of management scenarios allow to explore the activity of the enterprise comprehensively. The proposed and implemented recommendations during the evaluation of information management processes of the enterprise, combine the scenario approach and the method of correlation-regression analysis, as well as they allow to determine the impact of integrated indicators of labor, manufacturing and financial sphere on the indicator of ensuring the management effectiveness regarding information processes using different scenarios: pessimistic, neutral, optimistic. An important step in the evaluation process of the enterprise's activity is to determine the dominant in different development scenarios factors which influence the effectiveness of the information process of industrial enterprise management. Thus, during the pessimistic and neutral scenario, enterprise development is possible by increasing the usage efficiency of production means, such as labor and production funds. During the transformation, process from a pessimistic to a neutral scenario, the role of material incentives increases, in particular, the size of wages. In terms of the optimistic development scenario of enterprise, the priority of the solvency factor is increasing. Identified dominant factors make it possible to influence the state of the enterprise and reduce its sensitivity to changes. The developed methodical approach to the evaluation of the enterprise's information management process effectiveness is aimed at determining the critical levels of indicators, compliance with these indicators will improve the efficiency of the information management process of an industrial enterprise in case of gradual implementation of its stages. Implementation of the proposed methodological approach based on determination of indicators' limiting values allows to make the transition of the enterprise from a pessimistic development scenario to a neutral one, as well as from a neutral one to an optimistic, which in turn provides an opportunity to determine the target development parameters of the enterprise depending on the current state of its activity.

Keywords: information processes, strategic management, development scenario, principal component method, economy informatization.

Citation: Molchanova, K.; Olefirenko, K.; Shamborovskyi, G.; Kyrchata, I. (2024). INFORMATION PROCESSES IN MODERN ENTERPRISE MANAGEMENT IN THE SYSTEM OF VIRTUAL ECONOMY. *Conferencii*, (8) 3. http://doi.org/10.51586/Conferencii_8_3_2024

Introduction

At the stage of global economic relations development, effective transformations on the enterprise are possible, mainly through information processes, which explains the usage of information in management as the main factor of providing competitive advantages for the state and for each enterprise. Support of the information management processes requires new approaches and methods for analyzing information, as well as optimizing the directions of external and internal information flows. The information process becomes a qualitatively new production resource, which contributes to the manufacturing growth of information products and knowledge, rapid economic development at relatively low growth rates of material production. Nowadays, evaluation issue of information processes in management has become the subject of increased attention, reflecting the awareness of scientists that the modern industrial enterprise has significant differences, regarding the operation goals and the methods for achieving them, as well as requires fundamentally different management methods. In particular, all management functions require decisions regarding what requires effective communication and information exchange, implementation of certain information processes at all stages of the management process (goal setting, planning, regulation). Thus, management is a type of intellectual work that requires careful observation of facts, recording and storage of data, their control and analysis, selection and decision making. Substantiation of theoretical and methodological aspects of information process evaluation, as well as development of practical recommendations for their usage in the management of industrial enterprises in the informatization context of the economy – are the main purposes of the work.

Literature review

The current economic situation is characterized by the dynamism of the external and internal environment of enterprises, which are inherent in both the world and national economies (Jallow A. K., Demian P., Anumba C. J. & Baldwin A. N., 2017).

These changes create certain opportunities, but also serious threats to the stable functioning of enterprises, which in turn determines the need for quality and clear management in order to ensure their effective operation and development (Callahan C. & Soileau J., 2017).

It is well known that an enterprise, as a system, is not static in the long term and is constantly influenced by many factors, which necessitates its constant transformation, adaptation to a large amount of rapidly changing information (Centobelli P., Cerchione R., & Esposito E., 2018).

Qualitative management, in these circumstances, requires sound strategic and tactical decisions to be made during the development process of the enterprise; also, it requires clear and effective management tools (Hong J., Zhang Y., & Ding M., 2018).

Global development trends in society lead to the need to expand the usage of information, as well as information processes in management (Laumer S., Maier C., & Weitzel T., 2017).

The accelerated development pace of the information sector of the economy, where information is an important resource both at the level of society and at the level of the individual enterprise - is basic for modern society (Cooper R., 2017).

Thus, information from the additional factor of social manufacturing is transformed into a factor that significantly influences the economy, defense capability and politics (Florio C., & Leoni G., 2017).

Moreover, it should be noted that it is becoming almost a direct factor of economic growth, attracting a large part of material resources, and therefore it is an information potential (Zhuo Z., & Zhang S., 2019) or information resource of the socio-economic system, as well as a source of positive results at the level of society and enterprise (Olson D. L., & Wu D. D., 2017).

Thus, it is believed that modern management should be based on the ordering of information and information processes, which in turn will provide access to actual data and necessary resources in the management decision-making process (Berry-Stölzle T. R. & Xu J., 2018).

The efficiency of the enterprise activity is mainly determined by the development and effectiveness of the information infrastructure and the qualitative information usage (Li X., 2018).

It is well known that any process in an enterprise, from the risks it carries, to the maximum profit - is a two-way phenomenon (Appelbaum D., Kogan A., Vasarhelyi M. & Yan Z., 2017). Therefore, it is necessary to find certain possibilities of information and to change the mechanism of its usage in order to ensure a balance in which all processes in the enterprise will coexist harmoniously.

Methods

Fundamental provisions of economic theory and management are the theoretical and methodological basis of work.

In order to achieve this goal, the following general scientific and specific research methods were used: abstract-logical method, systematic approach, methods of analysis and synthesis - in order to clarify the concept of management information process, to define its characteristics and system of evaluation indicators; graphic - to visualize the results. The principal component method was used in order to determine factors that ensure the information management formation process on the industrial enterprise, taking into account all the benefits of mathematical modeling. Unlike simple methods of factor analysis, it allows to identify a sufficient number of characteristic factors of the phenomenon under study.

Compared to the group method, the advantage of using the principal component method is that it does not require pre-selection of elementary features, which in turn allows to simplify the analysis. The method of principal components differs from the method of principal factors by a much simpler logical construction; moreover, the general idea and target settings of factor analysis methods become clear thanks to this method.

The principal component method determines the k component of those factors that explain all the variance and correlation of the initial k variables; the components are formed according to the decay rule of the particle, which is explained by them, the total variance of the original variables, which allows to be limited to the first few components.

The first principal component F_1 defines the direction of the original features in the space, in which the set of objects (points) has the greatest dispersion.

The second principal component F_2 is constructed provided that its direction is orthogonal to the direction of F_1 , also it should explain most of the residual variance, etc. to the k main component F_k . Such transformation allows the information bulk to be narrowed by rejecting coordinates corresponding to the directions with minimal dispersion. Thus, the usage of the principal component method allows construct an integrated method of assessing the scenario of industrial enterprise management, which will be free from subjective evaluation and will be based on a significant number of factors.

Researches of scientists on problems of enterprise's strategic management, periodicals, results of expert surveys, resources of the Internet have become the information base of the research.

Results and Discussion

During the process of managing an industrial enterprise on the basis of evaluating the effectiveness of the information process, it is necessary to take into account the peculiarities of information, especially its ability to be a means of displaying processes, events, phenomena, as well as ability its multiple usage.

Depending on the stages of the management process, the role and importance of information varies. In some cases, its amount, structure, availability of sources are important; in others, its movement or possibilities and terms of accumulation and processing.

Thus, in the process of goals setting, the amount of information, its scientific and technical novelty, completeness are important, but in the process of situation assessment - the structure of the presentation, which determines the possibility of a systematic approach to evaluation, and during the decision making process - the ability to process this information, its timeliness and

completeness. Moreover, reliable and comprehensive information is the basis not only for operational and tactical, but also for strategic planning on business entities.

The economic development of the enterprise involves purposeful, quantitative and qualitative changes, which are influenced by certain regularities and lead to structural transformations, ensuring the effective functioning of the economic entity in the long term. Sustainable development, constant analysis of the factors influencing the information environment of an industrial enterprise will provide an opportunity to increase the adaptability of the enterprise to changing environmental conditions and to ensure its effectiveness in adverse conditions, as well as to increase its competitiveness.

In order to organize an effective information management process of an industrial enterprise, first and foremost, it is necessary to determine the priority management areas. For this purpose, factor analysis was used in the research process, aimed at identifying the factors that are crucial for each of the enterprise activity development scenarios. Identification of such factors will allow to concentrate on improvement of the priority problem areas of the enterprise's activity and also to determine the optimal meanings of information support indicators, adherence of which will help to increase the efficiency of entire management on the enterprise.

Considering the main disadvantages of the existing integrated methods for evaluating the efficiency of forming the information management process of an enterprise, in particular: the usage of the peer review method and the identification of insufficient factors; usage of inaccessible data. During this research the following requirements to the method of determining the priorities of enterprise management, based on the formation of management information process were identified:

- leveling of subjective evaluation during the calculation process of the final indicator or any component;

- taking into account as many factors as possible that influence the scenarios of the enterprise activity development;

- the usage of statistics data, which determine the factors of ensuring the efficiency of the information management process on the industrial enterprise, which are reflected in accounting and financial statements. This approach makes enterprise data accessible;

- validity of the approach from a mathematical point of view.

Taking into account everything mentioned the above, we can summarize that the factor analysis of the efficiency of the information process of managing an industrial enterprise in accordance with the scenarios of economic development of its activity was carried out during the research.

The study used the following indicators, which were selected in the previous stages of the study: workforce, production resources and finance to analyze the basic indicators of factor analysis. The data is official, reliable and available for usage information contained in the forms of enterprise's accounting and statistical reporting. Normalized values should be used (the distribution by the value of the maximum meaning of a factor) when constructing a system of output data, because it is measured in incomparable quantities.

Factor is a latent indicator built on principles to explain the correlation between a set of available indicators. Each variable of the factor analysis can be expressed by a linear combination of latent factors using the following equation 1:

$$X_i = a_{i1} \times F_1 + a_{i2} \times F_2 + \dots + a_{im} \times F_m - U_i \quad (1)$$

where X_i – indicator; i – number of indicators; a_{im} – factor load and for each m -component; F_i – major component; U_i – free member in the equation.

Latent factors are also expressed by linear combinations of the studied indicators:

$$F_i = b_{i1} \times x_1 + b_{i2} \times x_2 + \dots + b_{ik} \times x_k \quad (2)$$

where b_i – coefficient meaning for the factor x_i .

Factor analysis was conducted separately for each of the development scenarios of the enterprise activity in order to determine the indicators that have led to the transition from one scenario to another.

The principal component method was implemented using Statistica 13.2 software. It is advisable to rotate the factors in order to improve the results of the factors and to obtain a solution that will have the further economic interpretation.

The rotation of the coordinate axes was performed using the Varimax method with Kaiser normalization, which is designed to maximize the variance of the output factor loadings squares by the variables for each factor. After the rotation of the factors, the situation becomes clearer - a meaningful economic interpretation is obtained.

The Kaiser criterion was used to substantiate the optimal number of factors according to which those factors are considered and are statistically significant, i.e. values greater than one.

According to the Kaiser criterion, 3 factors were selected for providing information management processes to the industrial enterprise in accordance with the activity development scenarios (Table 1).

Table 1. Statistical characteristics of the factors regarding the effectiveness ensuring of the formation of information process of industrial enterprise management according to the activity development scenarios

Factor	Own value	The variance percentage, %	Cumulative own values	The cumulative variance percentage, %
Pessimistic scenario				
1	2,38	38,14	2,38	38,14
2	1,96	31,41	4,34	69,55
3	1,23	19,71	5,57	89,26
Neutral scenario				
1	3,26	40,95	3,26	40,95
2	2,08	26,13	5,34	67,09
3	1,34	16,83	6,68	83,92
Optimistic scenario				
1	2,05	31,59	2,05	31,59
2	1,88	28,97	3,93	60,55
3	1,57	24,19	5,5	84,75

Source: author's calculations

The cumulative variance percentage in the pessimistic, neutral and optimistic scenarios for the development of industrial enterprises is 89,26%; 83,92% and 84,75% respectively. That is, the variance value is more than 80%, that testifies to the correctness of factor analysis and sufficient number of factors to ensure the effectiveness of the information management process formation on the industrial enterprise. The range of factors formed on the basis of factor loadings (Table 2). The indicator is included into the factor with which the load is statistically significant ($> | 0.7 |$). Factor loadings are interpreted as correlations between the factors for ensuring the efficiency of industrial enterprise management and the variables of the enterprise management objects.

It is possible to design several approaches to the organization of future activity in advance, by grouping the factors of the development scenarios of the enterprise activity. All necessary prerequisites and possible changes in the factors of influence are taken into account and agreed. Factoring the results of the implementation of a particular scenario is the basis for creating an enterprise management system in the process of developing an effective strategy for its functioning.

As a result of statistical processing of data within the framework of the information process of management of machine-building enterprises by sample range, it is possible to generalize qualitative and quantitative assessment and, as a consequence, to draw certain conclusions.

Thus, based on the calculation of the correlation coefficients between the values of the integral indicator of ensuring the effectiveness of information management processes of the industrial enterprise and the values of the selected factors, it was found that all factors are drivers of

activity development, because correlation coefficients have positive values for them: 0,75 - for the pessimistic scenario, 0,84 - for the neutral and 0,81 - for the optimistic. Among the indicators of the efficiency usage factor regarding the production means, which is a stimulation of the enterprise's activity development, the index of capital intensity has a negative value of factor loading, which testifies to the reverse influence on the development of the enterprise - destabilizing. Fundamentality shows how much the value of an enterprise's fixed assets is per unit of net income, that is, it is an inverse indicator of the efficiency of the fixed assets usage.

Table 2. Factor loadings of indicators regarding ensuring the effectiveness of the information process of managing an industrial enterprise under the activity development scenarios

Factor	Indicators	Factor loading
Pessimistic scenario		
Factor 1 - the factor of usage efficiency of production means	Labor productivity	0,98
	Capital productivity	0,74
	Capital intensity	-0,86
	Capital ratio	0,79
Factor 2 - the factor of material work encouragement	Average salary	0,82
	Average salary of full-time workers	0,75
	Working time fund for which salaries for full-time employees are calculated	0,88
Factor 3 - the factor of the enterprise solvency	Absolute liquidity coefficient	0,84
	Coefficient of coverage	0,96
	Autonomy coefficient	0,87
Neutral scenario		
Factor 1 - the efficiency usage of production means	Labor productivity	0,94
	Capital productivity	0,86
	Capital intensity	-0,75
	Capital ratio	0,84
	Average salary	0,86
Factor 2 - the solvency of the enterprise	Absolute liquidity coefficient	0,75
	Coefficient of coverage	0,84
	Autonomy coefficient	0,89
Factor 3 - material incentives for work	Average salary of full-time workers	0,84
	Working time fund for which salaries for full-time employees are calculated	0,76
Optimistic scenario		
Factor 1 - the solvency of the enterprise	Absolute liquidity coefficient	0,92
	Coefficient of coverage	0,90
	Autonomy coefficient	0,83
	Capital productivity	0,79
Factor 2 - the efficiency usage of production means	Labor productivity	0,90
	Capital intensity	-0,89
	Capital ratio	0,76
Factor 3 - material incentives for work	Average salary	0,83
	Average salary of full-time workers	0,91
	Working time fund for which salaries for full-time employees are calculated	0,86

Source: author's calculations

For the pessimistic scenario of enterprise development, the factor of efficiency of using the production means is the main factor for ensuring the effectiveness of the information process formation of industrial enterprise management.

In order to overcome the pessimistic scenario, the priority task of the management process is to ensure the usage efficiency of labor resources and fixed assets based on the growth of labor productivity, capital productivity, capital ratio and decrease in the capital intensity index.

One of the key factors for ensuring the efficiency of the information process formation of industrial enterprise management under the pessimistic scenario is labor productivity, the factor loading of which is 0.98.

Information on labor cost savings can be a major contributor to productivity growth in engineering enterprises. Scientific and technological progress plays a significant role, manifested in the following aspects: the usage of new technologies, the improvement of systems and machines, the introduction of complex mechanization, engineering communications necessary to perform technological processes, as well as leading technologies and scientific developments, which in turn contributes to the improvement labor productivity, modernization of existing equipment.

Organization informatization of production processes of the engineering enterprises also has a significant impact. It allows you to effectively manage production, find rational methods of performing operations and identify other important factors.

The scientific labor organization has significant potential reserves for improving labor efficiency with minimal additional material costs. The most effective usage of operating capacities, diversification of production, reduction of time losses, etc., have a significant impact. Moreover, it should be noted that the inherent indicator of low labor productivity level within the framework of the national industry in general, including for the surveyed enterprises, is staff turnover, which can be attributed to the employees' dissatisfaction with the working conditions, the size of their salary and their desire to satisfy their needs by obtaining a new working place.

The staff turnover that does not affect the general number of employees due to the recruitment of new employees is quite significant. However, new workers need to adapt to the new place of work, production conditions, even if it is an experienced worker; moreover, for those who first came to the company, it takes time to learn the job, and also experienced employee should to be attached to them, whose work efficiency, respectively, is also reduced.

The results of the study show that the indicators of capital productivity, capital intensity and capital ratio have a significant influence on the management of enterprises of the engineering industry under the pessimistic scenario of activity development. An analysis of the usage efficiency of fixed assets at enterprises showed that mainly the cost of sold products is increased due to the growth in amortization.

At the same time, calculated amortization for the renewal and expansion of production is not used, because every year the difference between the real depreciation and the financial recovery of fixed assets increases, which leads to a deterioration of their financial position and reduces management efficiency. Enterprises use direct method of amortization of fixed assets: they do not take into account the moral wear and tear and differences in the production capacity of fixed assets in different years of their operation, as well as the need to increase the cost of repair in recent years of service. In our opinion, the management of enterprises should change the direct method of amortization to accelerated, which in turn will accelerate the process of updating enterprise's fixed assets, accumulate sufficient funds for technical re-equipment and reconstruction of production, reduce income tax, maintain fixed assets at a high technical level.

The factor of usage efficiency of production means is also a priority under the neutral scenario of activity development of the enterprise, but its composition is supplemented by the indicator of average salary. In order to develop the activity under this scenario, it is necessary to ensure the efficiency of using the production means at the enterprise and to stimulate the employees by increasing salary.

Remuneration based on traditional wage systems, is ineffective in most cases in the process of meeting the requirement of fair payment system on the industrial enterprises. Remuneration based solely on tariff delimitation is often criticized for the lack of stimulus to increase productivity. A typical hourly form of remuneration is characterized by a lack of account of individual work achievements. Thus, in order to ensure the effective enterprise development under the neutral scenario, it is advisable to improve the performance measurement indicators by introducing a

system of motivating payments. Its main task should be to ensure that the amount of salary corresponds to the final market results at the enterprise and to the growth level in sales of goods in terms of expanding market demand for products. According to the optimistic scenario of the activity development of the enterprise, the priority factor at the stage of management is solvency of the enterprise, which includes the coefficient of absolute liquidity, coverage, autonomy, capital productivity.

The study also found that the lack of correlation between the major balance groups, the presence of significant problems with the timeliness of calculation operations adversely affect the solvency of industrial enterprises under the optimistic scenario of development.

In addition, an unsatisfactory structure of the equity was identified due to the existence of uncovered losses.

The enterprise management process should be aimed at optimizing reserves supplies, work in progress and finished products in order to increase solvency. Optimization of reserves levels should affect the redistribution of working capital of enterprises in an optimistic scenario, which will lead to the opportunity to increase the amount of liquid money and reduce the value of illiquid reserves.

The operational mechanism of financial stabilization can be used to optimize the liquidity of enterprises, that is, to create a system of measures aimed, on the one hand, to reduce financial liabilities and, on the other, to increase the monetary assets that support those obligations.

Thus, in order to summarize everything mentioned above, during any development scenario of the enterprise activity the list of factors for ensuring the effectiveness of the information processes formation of industrial enterprise management (for instance, on the enterprises of the engineering industry) remains constant: factor of usage efficiency regarding the production means, factor of material encouragement of labor, factor of the enterprise's solvency. The composition of the factors and their priority change slightly. Depending on the development scenario, the priorities of enterprise management change. Thus, during the implementation of pessimistic and neutral scenarios, the development of the enterprise's activity is possible by increasing the efficiency of using the production means, such as labor resources and production funds. As we move from a pessimistic to a neutral scenario, the role of the material component of an effective management system - the size of salary - increases. If the company develops under the optimistic scenario, the priority of the solvency factor increases.

The main purpose of the formation and usage of the information process of industrial enterprise management is to develop and then implement an effective activity strategy. Scenario planning is not just an invention in the field of enterprise development scenario, it is closely linked to strategic planning and management. The contribution of scenario planning to the further development of an enterprise strategy is that the selected scenarios allow for a reasonable set of alternative strategies, which in turn contributes to the optimistic result of any enterprise.

Nowadays, the lack of the advantages usage of the strategic approach in the management of industrial enterprises is caused not only by the instability of the political and economic situation in the country, but also by the inconsistency of the enterprises' philosophy with market conditions.

For instance, managers often form a view from the future to the present, develop recommendations for achieving results in the short term in the future, taking into account changes in the environment, often do not specify the medium and long-term actions for the future, lack of proactive action. Mostly, short-term development plans are used by enterprises, which significantly reduces the efficiency of their operation and provokes insolvency risks. Therefore, in order to improve the productivity of the management information process, deterministic liminal values of modifying the scenario approach to the development of engineering enterprises as a component of effective strategic management were formed. Since the restructuring processes at the enterprises are not considered in the work, the development of the enterprises is possible only in an evolutionary way, during which qualitative changes are implemented slowly and consistently. In this regard, achieving a high level of management efficiency through information processes during the implementation of the pessimistic development scenario is possible due to a consistent chain of

modifications from the pessimistic development scenario to neutral, as well as from neutral to optimistic, from optimistic to the target state. (high level of management efficiency).

If a neutral scenario is implemented, the modification chain has the following implementation algorithm: neutral scenario - optimistic, optimistic scenario - high level of management efficiency based on the usage of management information processes. Under the optimistic scenario of activity development, there are no intermediaries on the way to achieving high level of industrial enterprise management efficiency.

Using factor analysis, priority indicators in the management of an industrial enterprise were identified, providing modification to the neutral scenario of activity development and they are the following: labor productivity, capital efficiency, capital intensity, capital ratio.

Conclusion

Evaluation of management information processes involves the usage of the indicators set and makes it possible to analyze comprehensively and then consider the management information process. The proposed set of indicators for evaluating information management processes in an industrial enterprise takes into account all aspects and parameters of information processes not only by qualitative but also by quantitative criteria, and also contains a performance component that is based on economic parameters and allows to evaluate the whole set of labor indicators, financial and industrial spheres activities that reflect the state of the enterprise the most fully.

The influence of integrated indicators of labor, production and financial sphere on the index of ensuring the effectiveness of management information processes under different scenarios of development: pessimistic, neutral, optimistic was determined. This in turn provides the opportunity to form different scenarios for the development of enterprise activity and will allow to implement a preventive management function aimed at neutralizing the negative impact of destabilizing factors at different stages of enterprise's activity.

By using the tool of multivariate factor analysis, the factors of ensuring the effectiveness of the information process of managing an industrial enterprise that are dominant in different scenarios of its activity development, are determined. Thus, it was determined that for pessimistic and neutral scenario this factor is the efficiency of using the production means, and for the optimistic one - the factor of the enterprise's solvency.

Priority factors have also been developed that are appropriate to use when developing a methodological approach to improving the quality of an industrial enterprise's management process if a pessimistic, neutral or optimistic scenario for the development of an activity is implemented at the enterprise.

A methodological approach to evaluating the effectiveness of the information management process of an industrial enterprise has been developed on the basis of determining the limiting values of indicators that cause the transition of the enterprise from a pessimistic scenario of activity development to a neutral one, from a neutral to an optimistic one, which in turn gives the opportunity to determine the target parameters for the development of the enterprise, depending on the state of its current activity.

Funding: This research received no external funding.

Conflicts of Interest: The authors declare that no potential conflicts of interest in publishing this work.

References

- Appelbaum, D., Kogan, A., Vasarhelyi, M., & Yan, Z. (2017). Impact of business analytics and enterprise systems on managerial accounting. *International Journal of Accounting Information Systems*, 25, 29-44. <https://doi.org/10.1016/j.accinf.2017.03.003>
- Berry-Stölzle, T. R., & Xu, J. (2018). Enterprise risk management and the cost of capital. *Journal of Risk and Insurance*, 85(1), 159-201. <https://doi.org/10.1111/jori.12152>
- Callahan, C., & Soileau, J. (2017). Does enterprise risk management enhance operating performance?. *Advances in accounting*, 37, 122-139. <https://doi.org/10.1016/j.adiac.2017.01.001>
- Centobelli, P., Cerchione, R., & Esposito, E. (2018). Aligning enterprise knowledge and knowledge management systems to improve efficiency and effectiveness performance: A three-dimensional Fuzzy-based decision support system. *Expert Systems with Applications*, 91, 107-126. <https://doi.org/10.1016/j.eswa.2017.08.032>

- Cooper, R. (2017). *Supply chain development for the lean enterprise: interorganizational cost management*. Routledge. <https://doi.org/10.1201/9780203737873>
- Florio, C., & Leoni, G. (2017). Enterprise risk management and firm performance: The Italian case. *The British Accounting Review*, 49(1), 56-74. <https://doi.org/10.1016/j.bar.2016.08.003>
- Hong, J., Zhang, Y., & Ding, M. (2018). Sustainable supply chain management practices, supply chain dynamic capabilities, and enterprise performance. *Journal of Cleaner Production*, 172, 3508-3519. <https://doi.org/10.1016/j.jclepro.2017.06.093>
- Jallow, A. K., Demian, P., Anumba, C. J., & Baldwin, A. N. (2017). An enterprise architecture framework for electronic requirements information management. *International Journal of Information Management*, 37(5), 455-472. <https://doi.org/10.1016/j.ijinfomgt.2017.04.005>
- Laumer, S., Maier, C., & Weitzel, T. (2017). Information quality, user satisfaction, and the manifestation of workarounds: a qualitative and quantitative study of enterprise content management system users. *European Journal of Information Systems*, 26(4), 333-360. <https://doi.org/10.1057/s41303-016-0029-7>
- Li, X. (2018). Research on enterprise management model innovation in the age of big data. *Research on Modern State-Owned Enterprises*, 20, 54. <https://doi.org/10.25236/icepms.2018.184>
- Olson, D. L., & Wu, D. D. (2017). Data mining models and enterprise risk management. In *Enterprise risk management models* (pp. 119-132). Springer, Berlin, Heidelberg. https://doi.org/10.1007/978-3-662-53785-5_9
- Zhuo, Z., & Zhang, S. (2019). Research on the Application of Big Data Management in Enterprise Management Decision-making and Execution Literature Review. In *Proceedings of the 2019 11th International Conference on Machine Learning and Computing* (p. 268-273). <https://doi.org/10.1145/3318299.3318388>



© 2024 by the authors. Submitted for possible open access publication under the terms and conditions of the Creative Commons Attribution (CC-BY) license (<http://creativecommons.org/licenses/by/4.0/>).

Conferencii
Volume 8, 2024

INTERNATIONAL INTERDISCIPLINARY CONFERENCE:
RESEARCH AND INNOVATION 2024

22 March, 2024
London, United Kingdom

© 2024 The Authors.

Published by
European Academy of Sciences Ltd,
71-75 Shelton Street, London, United Kingdom

This is an open access journal and all published articles are licensed
under a Creative Commons Attribution 4.0 International License.