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The Influence of System Quality, Information Quality and Service Quality on Net Benefit through User Satisfaction for Peduli Lindungi Applications in the Merdeka University Malang Postgraduate Program

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Abstract:- This research is based on the main problem, namely the worldwide pandemic outbreak caused by Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) aka COVID-19. As the virus began to spread globally on earth, the World Health Organization (WHO) announced on 30 January 2020 that COVID-19 was a Public Health Emergency of International Concern (PHEIC). The PeduliLindungi (Contact Tracing) application relies on the support of the community to share location data with the server when traveling or to public places where there are crowds of people (train stations, malls) so that tracing the history of contact records with sufferers of COVID-19 can be done with the help of a computer. The study was used to examine the effect of System Quality (X1) Information Quality (X2) Service Quality (X3) as the independent variable and Net Benefit as the Dependent variable (Y2) through User Satisfaction (Y1). Data processing includes analysis of reliability, validity, normality test, multicollinearity, heteroscedasticity, and autocorrelation. This research uses quantitative analysis through the use of the Path Analysis Method which is intended to determine the magnitude of the influence of the independent variables on the dependent variable. Respondents were Postgraduate students at the Merdeka University Malang class of 2020 and 2021. The research was carried out by distributing a questionnaire via the Google form via Whatsapp with a Lickert scale. The research studied the direct and indirect relationship between System Quality (X1) Information Quality (X2) Service Quality (X3) as an independent variable and Net Benefit as a Bound variable (Y2) through User Satisfaction (Y1). From the results of the regression analysis, the coefficient that links the dependent and independent variables is obtained.

Keywords:- *quality, system, information, net benefit, Application, PeduliLindungi.*

I. INTRODUCTION

The year 2020 will always be marked and recorded in history by the worldwide pandemic caused by Severe Acute Respiratory Syndrome Coronavirus 2 (SARS-CoV-2) aka COVID-19. As the virus began to spread globally on earth, the World Health Organization (WHO) announced on 30 January 2020 that COVID-19 was a Public Health Emergency of International Concern (PHEIC).

The PeduliLindungi application (Contact Tracing) relies on the support of the community to provide location data to a server when traveling or to public places where there are crowds of people (train stations, malls) so that tracing the history of contact records with sufferers of COVID-19 can be done with the help of a computer. Users of the PeduliLindungi (contact tracing) application will also receive a message if they are in a public place or in a red zone, namely an area or zone where it has been recorded that there are people who are positively infected with COVID-19 (spreaders) or there are patients under surveillance.

Machida Masaki, et. all, 2021, Researchers aim to identify problems, and factors hindering the implementation and correct use of COVID-19 contact tracing applications among ordinary citizens in Japan. The findings suggest that income can create inequalities in the efficacy and effectiveness of COVID-19 contact tracing apps. Awareness action strategies to allay these concerns and support communities of low-income individuals may be needed.[1].Technology has proven useful in enhancing traditional contact tracing processes during the COVID-19 pandemic.

The Management Information System consists of five elements, viz. Input, Analysis and Processing, Storage and Retrieval, Output, and Information Flow. The input is entered into the system in the form of raw or semi-finished data. Usual input/input brought in the normal operation of the system is in the form of reports, correspondence, minutes of discussions and meetings, published documents and books, reports, etc. For electronic systems, input data must be in a form that can be read by a computer. For this purpose, it is usually transferred to a disc, cassette, etc.

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Management Information Systems are broad systems that provide decision-makers with the information necessary to make effective decisions[2][3][4]. As a separate discipline, MIS is concerned with the study of information and its impact on individuals, organizations, and society. These are systems that create, process, store, and generate information within and outside an organization . More recently, MIS has become almost synonymous with computerized systems. The purpose of MIS is to provide information for decision-making, planning, initiating, managing and controlling the operations of the company's subsystems, and also to provide organizational synergy in the process.

This paper will discuss (1) system quality variables, information quality, and quality services in the Postgraduate environment of Merdeka University Malang. The discussion will also look at (2) the effect of these variables on user satisfaction and net benefits. This research is expected to provide information to the Merdeka University of Malang so that they can improve services in the use of the PeduliLindungi Application.

II. LITERATURE REVIEW

System quality is the desired characteristic of an information system [5][6][7] System quality is a characteristic of the desired IS model and summarizes the size of the IS model itself. These steps usually focus on the usability aspects and performance characteristics of the system under study. Information quality includes accuracy, completeness, and timeliness of the output generated by the information system. Information quality is determined if it can meet the expectations of information system users. Information quality is often a dimension that greatly influences user satisfaction instruments. [8][9] [7] in their research showed that system quality and information quality have a positive effect on user satisfaction. Information quality includes accuracy, completeness, and timeliness of the output generated by the information system. Information quality is determined if it can meet the expectations of information system users. User satisfaction is the effect that is sustained and felt by a person on his work by using an information system[10]. Net Benefit is the extent to which information systems play a role (or do not contribute) to the success of a person, group, organization, industry or country. For example; increased decision-making, increased productivity, increased sales, reduced costs, increased profits, market efficiency, consumer welfare, job creation, and economic development[1][11][12]. Net Benefit is a measure of Information Systems significantly influenced by user satisfaction[13][14][15].

III. RESEARCH METHODOLOGY

The research design uses a causality design with a quantitative approach. Source of data using primary and secondary data. The instrument used was a questionnaire using a Likert scale. Likert scale on choice 1 strongly disagree, 2 disagree, 3 neutral, 4 agree, and choice 5 strongly agree. The research was conducted at the Postgraduate Faculty of Merdeka University Malang. The population is 112 students of the Postgraduate Master of Management class of 2020 and 94 people of the 2021 class. So the entire population is 206 people. While the sample is 81 people. Questionnaires were distributed to respondents via Whatsapp in the form of a Google form.

System quality behavior is measured by 4 indicators, namely user convenience, system features, speed of access, efand ficiency. Information quality is measured by 3 indicators, namely timeliness, completeness, and reliability. Service quality is measured by 3 indicators including responsiveness, flexibility, and interpersonal quality. User satisfaction with indicators of information satisfaction, system satisfaction, and enjoyment.

Table 1: Variables, Indicators, and Number of Instrument Items

Variables and Indicators	Number of Instrument Items
System Quality (X1)	
User Ease (X1.1)	2
System Features (X1.2)	2
Access Speed (X1.3)	2
Efficiency (X1.4)	2
Information Quality (X2)	
Punctuality (X2.1)	2
Completeness (X2.2)	2
Reliability (X2.3)	2
Quality of Service (X3)	
Responsive(X3.1)	2
Flexibility (X3.2)	2
Interpersonal Quality(X3.3)	2
User Satisfaction (Y1)	
Information Satisfaction (Y1.1)	2
System Satisfaction (Y1.2)	2
Enjoyment (Y1.3)	2
Net Benefit (Y2)	
Work Effectiveness(Y2.1)	2
Work Simplification(Y2.2)	2
Productivity (Y2.3)	2
Total	32

IV. RESEARCH RESULTS

The researcher distributed questionnaires to Postgraduate students at Merdeka University Malang, Master of Management Department, Class of 2020 and 2021. The total population and questionnaires returned (sample) were 81 people.

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Tabel 2: Respondent profile

Gender	**%**	**Age**	**%**	**Income/*Salary***	**%**
Man	53	20 -30	47	3	41
Women	47	31-40	28	3–3,5	7
		41-50	17	3,5–4	19
		51-60	7	4–4,5	33

The number of sources is balanced between men and women, the majority are aged 20 to 30 years, salary of $> \approx 3$ million. The analysis of the data assessment was carried out with the help of SPSS software. There are 5 research variables, indicators and instruments. The results of the research instrument reliability test showed a good level of reliability as evidenced by Chronbach's alpha value which did not exceed the r table value (0.336). The results of the descriptive analysis for each research variable, 16 indicators, and 32 research instruments are presented in the appendix.

Analysis of data processing using the SPSS program. There are 5 research variables, 16 indicators, and 32 instruments in total. The results of the validity and reliability tests of the 32 items proved to be valid as evidenced by the probability that each instrument did not exceed a 5% error rate. The results of the validity test are attached. The results of the research instrument reliability test showed a good level of reliability as evidenced by Chronbach's alpha value which did not exceed the r table value (0.219). The results of the descriptive analysis for each of the 5 research variables, 16 indicators, and 32 research instruments are presented in the appendix.

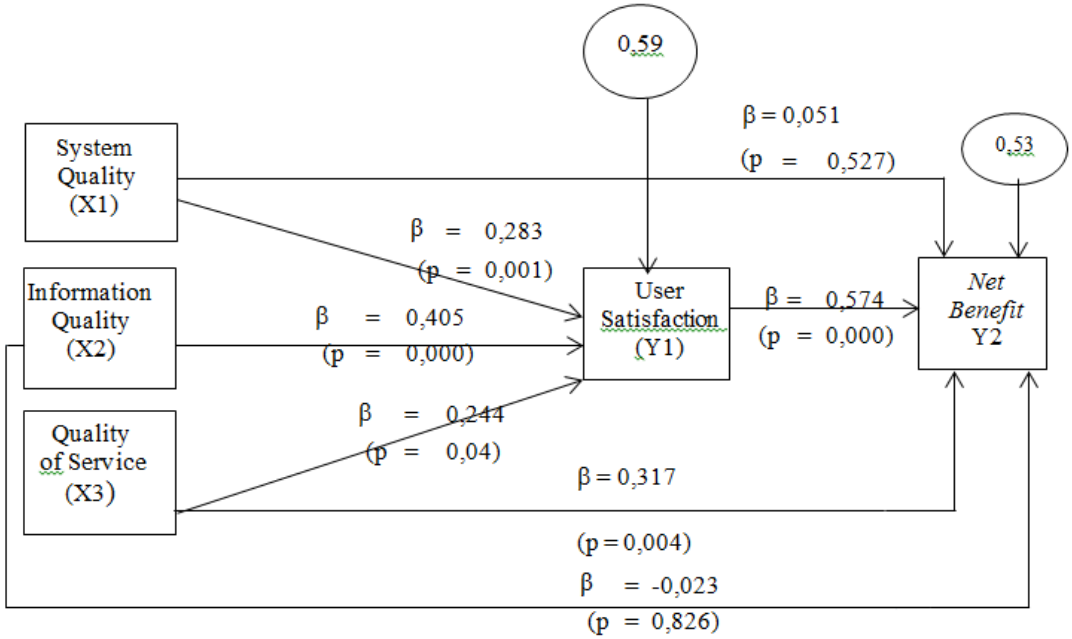

Fig. 1: Path Analysis

Based on the path diagram model shown in Figure 1, it can be seen that each direct and indirect impact (the path ratio value of the independent variable to the mediating variable is multiplied by the path ratio value of the mediating variable to the dependent variable) for each path and the total path value. In this path, the results of the influence of system quality (X1), information quality (X2), and service quality (X3) on net benefits (Y2) through user satisfaction (Y1) are presented in the following table.

The coefficients e1 and e2 show the value of each path of influence between variables with $e_1 = \sqrt{1-R_1^2} = \sqrt{1-0,646} = 0,59$ or 59% and $e_2 = \sqrt{1-R_2^2} = \sqrt{1-0,718} = 0,531$ or 53% .

The perceived value of system quality, information quality, and service quality about to with concerning net benefits through user satisfaction is displayed in the path analysis. R12= 0.65 is a summary of the results of multiple linear regression analysis which means that the variables of system quality, information quality, and service quality contribute 65% to user satisfaction (Y1) and the remaining 35% are related to other variables, other variables not included in this investigation/research. R22 is 0.72 which means that the variables of system quality, information quality, and service quality contributes 72% to user satisfaction (Y1) and the remaining 28% is caused by other variables not included in this study.

Table 3: Recapitulation of Path Analysis Results

No	Variable	Direct Influence	Indirect Influence	Total Impact	Information
1	System Quality (X1) to User Satisfaction (Y1	0,283	-	-	SIG. p=0.001
2	Information Quality (X2) to User Satisfaction (Y1)	0,405	-	-	SIG. p=0.000
3	Service Quality (X3) to User Satisfaction (Y1)	0,244	-	-	SIG. p=0.04
4	System Quality (X1) to Net Benefit (Y2)	0,051	-	-	Not SIG p =0,527
5	Information Quality (X2) to Net Benefit (Y2)	-0,023	-	-	Not SIG. p=0,826
6	Quality of Service (X3) to Net Benefit (Y2)	0,317	-	-	SIG. p=0.004
7	User Satisfaction (Y1) to Net Benefit (Y2)	0,574	-	-	SIG. p=0.000
8	System Quality (X1) to Net Benefit (Y2) through User Satisfaction (Y1	-	0,283×0,574 = 0,162	0,283 + (0,051×0,574) = 0,312	SIG
9	Information Quality (X2) to Net Benefit (Y2) through User Satisfaction (Y1)	-	0.405×0,574 = 0,232	0,405 + (- 0,023×0,574) = 0,387	SIG
10	Service Quality (X3) to Net Benefit (Y2) through User Satisfaction (Y1)	-	0,244×0,574 = 0,140	0,244 + (0,317×0,574) = 0,386	Not SIG

Based on the generalization of the results of the path analysis, it was found that the indirect effect of system quality variables, information quality, and service quality on user loyalty through user satisfaction, then to determine the influence of the status of the mediating variable, is formulated with the following provisions: 1) The variable between has influence or mediator status if the value of the indirect effect is greater than the value of the direct influence 2) The intermediate variable has no influence or mediation/intermediary status if the value of the indirect effect is smaller than the value of the direct effect.

This definition can be used to explain whether each of the independent and dependent variables is mediated by the user satisfaction variable. The impact of system quality on net benefits through user satisfaction becomes more real (indirect effect) with an effective value of 0.162 and a direct effect of 0.051. This explains why user satisfaction has the status of an intermediary variable in the effect of system quality on net benefits because the indirect effect is greater than the direct effect.

The impact of information quality on net benefits through user satisfaction (indirect effect) with an effective value of 0.232, a direct effect of -0.023. This can explain that user satisfaction is an intermediate variable in the influence of information quality on net benefits because the indirect effect is greater than the direct effect. The effect of service quality on the net benefit through user satisfaction with an indirect effect value of 0.140 and a direct effect to obtain a value of 0.317. The indirect effect is smaller than the direct effect, which can explain that user satisfaction does not have the status of an intermediary variable in the effect of service quality on net benefits.

V. DISCUSSION

Classical hypothesis tests that are commonly performed are normality tests, multicollinearity tests, heteroscedasticity tests, and autocorrelation tests Classical hypothesis tests are needed to ensure that the resulting regression equation has certainty in estimation, is not biased ,and is consistent. In this study, testing the classical hypothesis was carried out on two sub-frames with 3 independent variables, 1 intermediate variable and 1 dependent variable. Regression of system quality variables, information quality, service quality on user satisfaction is analyzed in subframe 1,and regression analysis of system quality, information quality, and service quality, and user satisfaction on net benefits is analyzed in subframe 2. Regression analysis should fulfill the classical assumptions, in research In this case, the classic hypothesis test used is as follows. Normality tests are used in statistics to determine whether a data set is well modeled by a normal distribution and to measure the degree of normal distribution of random variables that may underlie the data set.

This study tested 3 dependent variables, 1 intermediary variable, and 1 dependent variable, so the normality test was carried out on two sub-structurals. In sub-structure 1 check the normality of the independent variable system quality (X1), information quality (X2), and service quality (X3) for the dependent variable user satisfaction (Y1). Then test the normality of sub-structure 2, in this sub-structure the normality of the independent variables is examined for system quality (X1), information quality (X2), and service quality (X3), , and user satisfaction (Y1) on the dependent variable net benefit (Y2). The data can be declared normally distributed.

Multicollinearity forms a linear relationship between the independent variables in the regression model. In a good regression model, there is no correlation between the independent variables[16][17]. Detection is carried out using the Variance Inflation Factor (VIF). If the VIF value < 10, then multicollinearity does not occur, whereas if VIF > 10 then multicollinearity occurs (Ghozali, 2006). it can be concluded from the two comparisons that there is no multicollinearity in the regression 1 and sub-structure regression 2 models of this study.

Heteroscedasticity Test This test aims to test whether there is an inequality of residual variance from one observation to another in a regression model. If the variance remains constant from one observation to the next it is said to be Homoscedasticity and if it changes it is said to be Heteroscedasticity[18][19]. A good model/observation is a model that does not have heteroscedasticity, where the regression model must meet the requirements that are not met by heteroscedasticity[20][21]. This test is used to identify it. The aim is to test whether there are variance differences from the residuals from one observation to another observation in the regression model. If the variance from one observation to another is the same, then it is called Homoscedasticity and if it is different, it is called Heteroscedasticity. The results of the sub-structural heteroscedasticity test 1 show that there is no heteroscedasticity in this regression model. This model can be used to predict user satisfaction based on the independent variables of system quality (X1), information quality (X2), and service quality (X3). Sub-structural heteroscedasticity test results 2 show no heteroscedasticity and this regression model can be used to predict user satisfaction based on independent variables system quality (X1), information quality (X2), service quality (X3) , and user satisfaction (Y1).

The results of the SPSS analysis produce a sub-structural multiple linear regression model 1 (direct relationship) as follows: Y1 = 0,283 X1+ 0,405 X2 + 0,244 X3 + e. For the sub-structural multiple linear regression model 2 (indirect relationship) the regression equation is obtained as follows Y2 = 0,051X1 -0,023 X2 + 0,317 X3 + 0,574Y1+e.

VI. CONCLUSIONS AND SUGGESTIONS

For Substructural Test 1 and Substructural Test 2 which include direct and indirect effects, it is statistically proven that system quality has a significant effect on user satisfaction, information quality has a significant effect on user satisfaction, and service quality has a significant effect on user satisfaction. It is also statistically verified that the quality of the system does not significantly affect the net benefit and the quality of information does not affect the net benefit. Meanwhile, the ratio of service quality to net benefits and the ratio of user quality to net benefits have a significant and statistically confirmed effect. System quality to net benefits through user satisfaction and information quality to net benefits through user satisfaction has a significant effect and is tested statistically. Meanwhile, service quality to net benefits through user satisfaction has no significant and statistically confirmed effect

For Kominfo [22][23][24]: as administrator for the PeduliLindungi Application account (admin/server manager) which is the object of study, the results of this study may be used as a reference in improving the quality of the PeduliLindungi Application information system aimed at followers/users/followers. This investigation may be a reference for carrying out further studies related to assessing the success of information systems[25][26][27]. Limitations of this study include limitations on data obtained through questionnaires, due to online distribution making it difficult to present appropriate or inaccurate respondents as respondents and also differences in the perceptions of researchers and study respondents. It is necessary to pay attention to other things besides what has been done by current researchers such as how the attitude of human resources is in managing the system, how the environment is and how the system is developed in the future so that it can become a better reference in future system development [28][29][30]. Another suggestion that can be used in improving the system is to look at what needs and what is the pleasure of system users and the existing system is given additional informative features about the world of health or other entertainment so that users will be happier using it[31][32][33].

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APPENDIX

1. Variables, Indicator dan Instrumens

Table 4: Description of Research Instruments

Variabel	Indikator			Instrumen
Sistem Quality (X1) [34]	X1.1	User Easy	X1.1.1	The system I use is very simple
			X1.1.2	The system that I use, the menu layout makes it easy
	X1.2	System Features	X1.2.1	The system I use the menu options work
			X1.2.2	The system that I use layout looks easy to understand
	X1.3	Access	X1.3.1	The system I use is fast
			X1.3.2	The system I use gives good feedback (responsiveness)
	X1.4	Sistem Efficiency	X1.4.1	The system I use features the features I need
			X1.4.2	The system that I use can be accessed anytime and anywhere
Information Quality (X2) (Pérez-Mira Begoña , 2010)	X2.1	Punctuality	X2.1.1	The system I use provides up-to-date information
			X2.1.2	The system I use provides information in a timely manner
	X2.2	Completeness	X2.2.1	The system I use provides the information I need
			X2.2.2	The system I use embodies accurate information
	X2.3	Reliability	X2.3.1	The system I use provides reliable information
			X2.3.2	The information on the system that I use can be verified as correct
Quality of Service (X3) Parasuraman A,et.all 2005)	X3.1	Responsive	X3.1.1	The system I use the layout looks easy to understand
			X3.1.2	The system that I use can be accessed using a gadget
	X3.2	Fleksibilitas	X3.2.1	The system admin provided the information I needed
			X3.2.2	The system admin directs me to the information I need
	X3.3	Interpersonal Quality	X3.3.1	The system admin provides a good service response
			X3.3.2	The system admin provides the required information in a timely manner
User Satisfaction (Y1) [34]	Y1.1	Information Satisfaction	Y1.1.1	I feel aligned with the information obtained
			Y1.1.2	The existing information matches what I need
	Y1.2	System Satisfaction	Y1.2.1	I am satisfied with the system that I use
			Y1.2.2	I can use the system easily
	Y1.3	Enjoyment	Y1.3.1	I can access the system with my various devices
			Y1.3.2	I can easily get information
Net Benefit (Y2) (Livari Seddon. Peter)	Y2.1	Work Effectiveness	Y2.1.1	Existing systems can sho rten the time in searching for information
			Y2.1.2	The existing system can be accessed by users who need it anywhere and anytime
	Y2.2	Job Simplification	Y2.2.1	The use of the system is able to simplify users in searching for information
			Y2.2.2	system admin can provide information to users without having to come to the location
	Y2.3	Productivity	Y2.3.1	The system can shorten the time to the user
			Y2.3.2	The system can shorten the distance between admin and users

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Table 5: Recapitulation of Validity, Reliability and Descriptive Test Results

Variables and Indicators		Coefficients correlation	Chronbach's Alpha	Mean	
System Quality (X1)			0,856 $\alpha > 0,6$ reliable	4,16	
X1.1 User Ease	X1.1.1	0,602 $r_{table} = 0,219$; Valid		4,27	4,2
	X1.1.2			4,12	
X1.2 System Features	X1.2.1	0,615 $r_{table} = 0,219$; Valid		4,1	4,11
	X1.2.2			4,12	
X1.3 Access	X1.3.1	0,305 $r_{table} = 0,219$; Valid		4,12	4,18
	X1.3.2			4,24	
X1.4 Sistem Efficiency	X1.4.1	0,459 $r_{table} = 0,219$; Valid		4,1	4,15
	X1.4.2			4,2	
Information Quality (X2)			0,919 $\alpha > 0,6$ reliable		
X2.1 Punctuality	X2.1.1	0,757 $r_{table} = 0,219$; Valid		3,88	3,89
	X2.1.2			3,9	
X2.2 Completeness	X2.1.1	0,699		3,91	3,91
	X2.1.2	$r_{table} = 0,219$; Valid		3,91	
X2.3 Reliability	X2.3.1	0,695 $r_{tabel} = 0,219$; Valid		4,02	4,04
	X2.3.2			4,07	
Quality of Service (X3)			0,888 $\alpha > 0,6$ reliable	3,94	
X3.1 Responsive	X3.1.1	0,537 $r_{table} = 0,219$; Valid		4,12	4,23
	X3.1.2			4,33	
X3.2 Flexibility	X3.2.1	0,651 $r_{tabel} = 0,219$; Valid		4	3,96
	X3.2.2			3,91	
X3.3 Interpersonal Quality	X3.3.1	0,717 $r_{table} = 0,219$; Valid		4,04	3,94
	X3.3.2			3,84	
Customer Satisfaction (Y1)			0,876 $\alpha > 0,6$ reliable	4	
Y1.1 Information Satisfaction	Y1.1.1	0,837 $r_{tabel} = 0,219$; Valid		3,93	3,95
	Y1.1.2			3,96	
Y1.2 System Satisfaction	Y1.2.1	0,648 $r_{table} = 0,219$; Valid		4	4,02
	Y1.2.2			4,04	
Y1.3 Enjoyment	Y1.3.1	0,446 $r_{table} = 0,219$; Valid		4,09	4,06
	Y1.3.2			4,02	
Net Benefit (Y2)			0,869 $\alpha > 0,6$ reliable	4,02	
Y2.1 Work Effectiveness	Y2.1.1	0,564 $r_{table} = 0,219$; Valid		3,94	4,04
	Y2.1.2			4,14	
Y2.2 Job Simplification	Y2.2.1	0,539 $r_{table} = 0,219$; Valid		4,02	4,04
	Y2.2.2			4,05	
Y2.3 Productivity	Y2.3.1	0,458 $r_{table} = 0,219$; Valid		4,05	4
	Y2.3.2			3,93	