support of application and give initial feedback from surveys how to handle the challenges and situations. (Ateeq Khan and Klaus Turowski, 2016)

The main theme of this study is to check the significance of manufacturing techniques and long term plans in industry 4.0 vendor performance measures. Commonly as the manufacturing setup are open system and are dependent of external environmentalplayer'sincluding suppliers and customers. To check the significance of this study a survey based technique used to grab the data from respondents and applied a multi layered regression analysis. Based on the literature the four different strategiesfind out and evaluated as the correspondent to supplier performance checking parameters. The sample of 200 was collected to check the relationship between variables effectively. On behalf of finding it is stated that the performance of supplier under industry4.0 influences positively while some factor like cost didn't seen changes.The industry and country that has been taken is only in the study so it is not applicable for other country and industry. The paper helps and support the supply chain professional to examine the relationship between performance of vendor and supplier under the context of industry 4.0 and creates chances for improvement in process and better controllingmechanism through performance check.(Salam, 2019)

The industrial revolution 4.0 influences the burial of outdated production setups, the idea came up with super autonomous factories having integrated communication networks. To meet the customer unique requirement the setup supported by latest information technologies components. This latest manufacturing setup support by Manufacturing execution system. (Almada-Lobo, 2015).

2.1 Research Hypothesis

H1: Technical infrastructure impact significantly in implementation of industry 4.0

H2: Supplier flexibility and capabilities has significant relationship with o industry 4.0

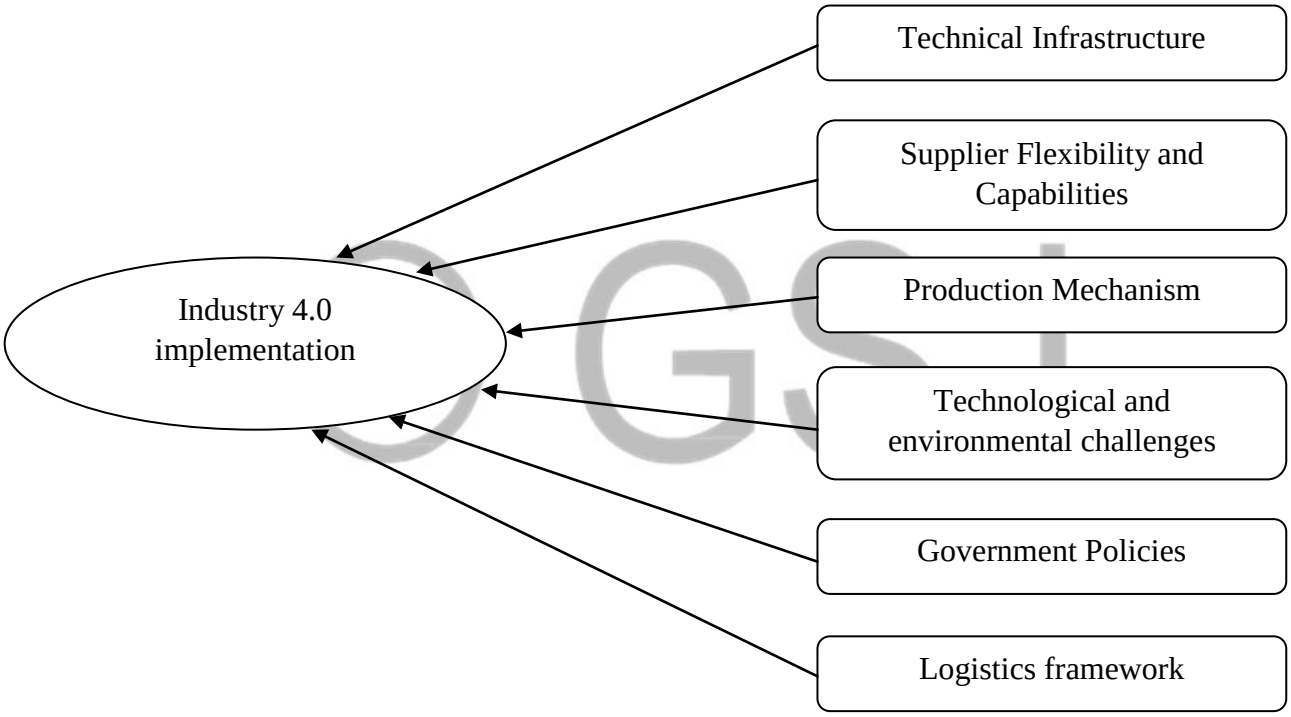
H3: Production mechanism has significant impact in industry 4.0 implementation

H4: Technological and environmental challenges has a significant relationship with industry 4.0

H5: Government or State policy has significant relationship with industry 4.0 implementation

H6: Logistics framework has a significant relationship with industry 4.0

2.2 Research Model



2.3 Theoretical Framework

Technical Infrastructure

Technological infrastructure are the separating wall for a country in global competition. The global competitions does not represent by wage criteria, prices or value of money. Technological leadership depict the real comparative advantage, because it can cope, create or cluster with technology. (Freeman, 2004)

Supplier Capabilities

Adopting rapid technological changes and capabilities to efficiently reply to customer needs. In OEM manufacturing is it really crucial to improvise their setups according to the customer level. (Yen-Tsung Huang and Wenyi Chu, 2010)

Production Mechanism

Not only the transformation of raw material or idea to finished product or services but with the exact need of customer and the way or style how raw material or idea transformed is known as production.(Business Dictionary)

Technological and Environmental challenges

Technology issue arise from the beginning point of implementation, as the tools and practices are new for the user. (Jeffrey T. Penka, 2003). Environmental issues in firms and managerial concepts primarily restricts the external environment threats on the survival of organization. (R.J.Orssatto, 2001)

Government Policies

It is a set of decisions or Future plans that a government expresses and announced through documented procedure. Change or cope a problem or issue that may hinder dramaticsituation for country or any technological opportunity that may give country a potential economic boom usually a part of long term goals.(AnkeHassel, 2015)

Logistics

Logistics management is consider as a science today as the requirement of the customer changes rapidly with fast pace the storage, transportation and sharing of information with right area known as logistics. In other term logistics is organizing, leading and controlling the flow of

goods or raw material from point of origin to point of consumption to meet the requirement. (Julien Bramel and David Simchi-Levi, 1997)

3.0 Methodology

The main objective of the study is to investigate the relationship betweenthe subjected Variables Including industry 4.0 implementation as a dependent variable and Technical infrastructure, supplier capabilities, productionmechanism, technological and environmental challenges, Government policies and Logistics as an Independent variables. A survey oriented approach is applied in this paper to get the primary data from different respondents from different manufacturing firms. It is the systematic collection way of data to understand and predict the attitude of participants of the target audience. The survey based technique is also quite cost cheaper than other techniques, fast and more reliable to gather information from audience of the population.(Salam, 2019) In this study the target audience are the industry professional people who are in the production department and have sound awareness of industry 4.0 and its factors.

3.1 Research Approach

The approach behind this research was quite simple because based on quantitative data the prediction of relationship among variables is quite easy and justifiable as compare to a qualitative technique. The explored result could be better addressed in quantitative approach.

3.2 Sample Size and Collection of Data

As earlier stated that the data has been collected from professional who are from supply chain management field, the participants were asked almost 42 different questions to get the out efficiently and proper analysis. How much the significance of independent variables impact on dependent variables the industry 4.0 implementation.For this instance 150 response were collected from different manufacturing firm'sprofessionals especially the automotive and textile firms of Pakistan. The data collection duration of this study was almost 1 month and closed in Dec 2019, after that a quality check was performed in order to check the accuracy of option feeding of the questionnaire from the respondent or checked any biased response. After quality checking the data further moved to analysis.

3.3 Research Instrument

The instrument that was used to collect the response was Likert scale based questionnaire form having 42 specific question regarding to the subject of the study. The question were adopted from past studies and to check the content of such question APh.D. qualified person checked the content of that research questionnaire. The options of likert scale base option were strongly agree, agree, neutral, disagree and strongly disagree. On the other side of the research data the secondary source was also utilize to build the concept through past studies and researches on the subjected topic, the inclusion of secondary data support the study by recorded and published statement of different researchers in the literature review segment of the study. Secondary source are the justification of reliability and validly of the selectedresearch topic that was further explored in the ongoing studies and researches.

3.4 Ethical Consideration

All ethical norm has been strictly followed in this study, all collected data from the participant from different industrial setups are kept confidential and t in secure custody and only be used for this specific research purpose. The respondent details are also remain highly confidential with this stream of the study.

4.1 Analysis of data

The core focus of this study is higly based on the relationship between Industry 4.0 (the dependent variable) and the technical aspect, supplier capabilities, production aspect, technical and environmental challenges, government policies and logistics taken as independent variables. In order to check the outcome a survey based data collection approach is used and after analysis of specific data it is revealed that there is a relationship exist between the variables that were used in this study. It is revealed that all independent variables has a significant relationship with industry 4.0.

4.2 Descriptive statistics

Statistics

		TA	SC	PA	TAEC	GP	LA	I4.0
N	Valid	150	150	150	150	150	150	150
	Missing	0	0	0	0	0	0	0
Std. Deviation		.46765	.72153	.46770	.36512	.48659	.59577	.33486

Variance	.219	.521	.219	.133	.237	.355	.112
Skewness	1.093	1.221	1.390	1.465	1.294	1.707	1.032
Std. Error of Skewness	.198	.198	.198	.198	.198	.198	.198
Kurtosis	1.484	.938	3.792	9.013	3.535	2.873	2.564
Std. Error of Kurtosis	.394	.394	.394	.394	.394	.394	.394

4.3 Regression Analysis

Variables Entered/Removed[a]

Model	Variables Entered	Variables Removed	Method
1	LA, TAEC, GP, TA, PA, SC[b]	.	Enter

a. Dependent Variable: I4.0

b. All requested variables entered.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	T Change Statistics				
					R Square Change	F Change	df1	df2	Sig. F Change
1	.129[a]	.017	-.025	.33898	.017	.401	6	143	.878

a. Predictors: (Constant), LA, TAEC, GP, TA, PA, SC

The R^2 value represent coefficient of determination, proportion of variance for regression model above or beyond the mean model. The R^2 of the study is .017 that mean study independent variable explains 17% variablility of dependent variable.

4.4 ANOVA Analysis

ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.276	6	.046	.401	.878[b]
	Residual	16.431	143	.115		
	Total	16.708	149			

a. Dependent Variable: I4.0

b. Predictors: (Constant), LA, TAEC, GP, TA, PA, SC

The study used multiple regression technique to predict CDL from the independent variable i.e. TA, SC, PA, TAEC, GP AND LA. The close F value predict that the null hypothesis is true while P value indicates the strong evidence in favor of null hypothesis.

4.5 Coefficients Analysis

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.757	.180		9.735	.000
	TA	-.067	.110	-.093	-.604	.547
	SC	.061	.079	.131	.766	.445
	PA	-.035	.092	-.049	-.381	.704
	TAEC	.067	.103	.073	.650	.517
	GP	-.023	.080	-.033	-.285	.776
	LA	.038	.084	.068	.454	.651

a. Dependent Variable: I4.0

4.6 Relaiability and Validity Test

Scale all variables

Case Processing Summary

		N	%
Cases	Valid	150	100.0
	Excluded[a]	0	.0
	Total	150	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.935	.933	46

The cronbach's alpha reperesents the relaiability of data collection tool (questionnaire), in this study the model indicate the relaiability of questionnaire is .935 or 93.5% relaiability level.

4.7 Hypothesis Summary

	Hypothesis	p-value	t-value	Emperical conclusion
H1	Technical infrastructure impact significantly in implementation of industry 4.0	.547	-.604	Accepted
H2	Supplier flexibility and capabilities has significant relationship with o industry 4.0	.445	.766	Accepted
H3	Production mechanism has significant impact in industry 4.0 implementation	.704	-.381	Accepted
H4	Technological and environmental challenges has a significant relationship with industry 4.0	.517	.650	Accepted
H5	Government or State policy has significant relationship with industry 4.0 implementation	.776	-.285	Accepted
H6	Logistics framework has a significant relationship with industry 4.0	.651	.454	Accepted

The table of hypothesis summary indicates based on the p and t value respectively the all hypothesis or assumptions in the study has been accepted and has a significant relationship.

4.7 Discussion

The overall analysis report indicates that tha relationship between indpenendent variable i.e. Technical aspect, Supplier capabilities, Production aspect, Technological and environmental challenges, Government policies, logistcial aspect and the dependent variable industry 4.0 respectively. In order to further explore about the study the other available analyzing technique should also be used in future, it would minimizes the ambiguty about the clear path for other researchers and practioners.

5. Conclusion

5.1 Conclusion

As the world is becoming a global village day by day thing and technologies are also upgrading with a sound pace, lets take the example of personal computers, cell phones, online markets etc are the expanding domain of this era. Organization are continuously came up with new idea like touch panel cell phone introduced by Apple inc, and right after that samsung and other cell phone manufacturer follow the same path with their expertise and marketing approach, many organization didn't adopt and abosrb the technological boom and become part of the past like Nokia, siemens etc. currently the concept of mass production is loosing its position by the introduction of concept mass customization as we regularly see in online website portal where a customer can design his/her own product by utilizing the customizing options just like the example of Dell computers, where you can choose your specification on online and placed directly order to the Dell, as the company is dealing with the direct channel of distribution involve no intermediery. The concept of mass customization is still infancy to mostly countries especially the underdeveloped, organziations operting in such countries are not well aware of it or the buying behavior is still on the same level or consumer is not so influencial.

The concept of mast customization is known as industry 4.0 or fourth industrial revolution, its was introduced by German government as part of their strategic plan and other countries are also planning for the transformation of industrial setups as per industrial revolution 4.0. China is also came up with Made in China 2025 plan, the objective is to minimizes the cost of production and

higher level of quality standardization by optimizes the industrial approach. The concpet of industrial revolution is the most famous and exiting domain for researchers and professional field personels as yet because the concept is not fully implemented and organization are still working with the transformation phase. As we know that transformation would also impact on other major area especially the supply chain management of an organization, this paper theme is also relate with the industrial revolution and inter-country supply chain management. The concept has a significant impact on supply chain functions as the technology adoption is rapidly changing the dynamics, manual practices are becoming obsolete, networks and entities are becoming integrated system under one umbrella, all upstream to downstream level become highly informative and works in coordinated systems. With the support of Internet of things (IoT), Cyber Physical System (CPS), the Big data, Autonomous robotic system and integrated networks the fourth industrial revolution is breathing and growing.

Based on this study the implementaion of the fourth industrial revolution is not only depends on the technological factors but other external factor and ground realities of the host country matters in successful transformation of the project. In this study the other factors are streamline with technological factors to check the results through a proper statistical study approach by analyzing the big research gap existed. The result of the study highlighted that other external factors like government policies, production approach, logistical infrastructure, technical grounds etc also has a significant impact on industry 4.0 and its transformation. In earlier said statement world is now a global village, supplier and other stakeholders must integrate in the same platform to get the desired outcome form the latest industrial mechenism. By the use of studied factors in this study it is vaiable for organization to get the thing easy and clear for their plans and can be easily tackle down any issues during transformation period.

5.2 Limitation and Recommendation

This data that has been collected for this study is from Pakistan, professional from different industry including automobile sector and Textile firms are commonly the source of the data behind this research. As it is not possible to cover all possible variables related to the study, so only six significant indepenedent variables and one dependent variable is taken for this study. The other common limitation is the study is only focused on the Pakistan industrial culture and

way of working, government policies etc, and not all industrial sector data analyze in this study so the study is limited to its domain and sample size which is 150 responses.

It is recommended to the research personels and professionals of the industries to further explore the concept of industrial revolution and its impacts on the same ground with large sample size and consider other potential factors that are still in viel and need to be explored for greater outcome efficieny and compatibility check for the transformation. It is also recommended that other fuctions of the organization including finance, Human resources, R&D etc may have also significantly influence by the transformation and the possible impact should need to evalute under some statistical grounds.

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