HBRP PUBLICATION

Research and Applications of Web Development and Design
Volume 3 Issue 1

CORRELATION for Variables Selection in Secure SDLC

S G Gollagi[1], Prof. Veeranna Kotagi[2], Dr Piyush Kumar Pareek[3*]
[1]Research Scholar, Department of CSE, East West Institute of Technology, Bangalore (VTU RRC), India.
[2]Research Scholar, Department of Computer Science & Information Technology, J.J.T. University, Rajasthan, India.
[3]Professor, Department of CSE, East West Institute of Technology, Bangalore, India.

Corresponding Author
E-Mail Id:- piyushpareek88@gmail.com

ABSTRACT

The engineer's understanding of a part's security properties must not be put together completely or even predominantly with respect to the provider's cases about that segment. Just a goal, exhaustive, and point by point security assessment of the segments that are being considered for use in the software framework can give solid information on the security suppositions of the segment, and the nearness of insecure practices and state changes, and of vulnerabilities and shortcomings in it. A great part of the choice procedure for gained and reused segments should concentrate on determining and mitigating the effect of contentions among suspicions and requirements. These include clashes among provider and integrator suppositions and requirements for how the part will be utilized and in what condition. They likewise include clashes between the security suppositions (e.g., about condition benefits that will be accessible) that the engineer has made for the benefit of the notional parts that "populate" his/her architecture, and the security suspicions under which the segments chose to satisfy the notional segments' jobs were created. In this paper a research survey is carried out using a well structured questionnaire to understand whether the variables considered for the study are significant or not, CORRELATION Test has been deployed and results have proved that variables considered are highly significant.

Keywords:-*Questionnaire, Cronbach alpha test and correlation*

INTRODUCTION

Steady quality improvement models are commonly designated Probabilistic models and Statistical models. Probabilistic steadiness progression models–by temperance of cloud parameters related with these models, the information got during the program can't be joined. Accurate unflinching quality headway models–cloud parameters are associated with these models.

- Time self-administering unwavering quality headway models – number of dissatisfactions or fixes in unequivocal time between time are not relied on schedule.
- Time subordinate determined quality improvement models – a reliability progression model is breaking point of time.
- Continuous dependability improvement models – these are time models.
- Discrete dependability improvement models – these are helpful for unrecoverable articles, there are two discrete states – an unfaltering quality working state or a mix-up.
- Classically resolute quality improvement models – intelligent gear is hypothesis of likelihood.

- Duane resolute quality improvement model and its changes – these are relentless, time destitute and accurate models.
- Stochastic suffering quality headway models – a dependability improvement is non-stationary stochastic strategy.
- Bayes and semi Bayes suffering quality headway models.
- Unconventional suffering quality headway models – there are all dependability improvement models, for which is no current acceptability to design every single together class.

REVIEW OF LITERATURE

Table 1:-*Secure SDLC Processes*

Methodology	Resources
CLASP	Secure Software Inc. *CLASP: Comprehensive Lightweight Application Security Process*. Version 2.0, 2006. Accessed 17 December 2007 at: http://searchappsecurity.techtarget.com/searchAppSecurity/downloads/clasp_v20.pdf
	Open Web Application Security Project (OWASP) CLASP Project Webpage. Accessed 17 December 2007 at: http://www.owasp.org/index.php/Category:OWASP_CLASP_Project
Security Development Lifecycle (SDL)	Howard, Michael and Steve Lipner. *The Security Development Lifecycle*. Redmond, Washington: Microsoft Press, 2006.
	Lipner, Steve and Michael Howard. "The Trustworthy Computing Security Development Lifecycle". Microsoft Developer Network, March 2005. Accessed 17 December 2007 at: http://msdn2.microsoft.com/en-us/library/ms995349.aspx
	Microsoft SDL Weblog. Accessed 17 December 2007 at: http://blogs.msdn.com/sdl/
McGraw's Seven Touchpoints	McGraw, Gary. *Software Security: Building Security In*. Boston, Massachusetts: Addison-Wesley Professional, 2006.
	Software Security: Building Security In Webpage. Accessed 17 December 2007 at: http://www.swsec.com/
TSP-Secure	Over, James W. "TSP for Secure Systems Development" (presentation). Accessed 17 December 2007 at: http://www.sei.cmu.edu/tsp/tsp-secure-presentation/tsp-secure.pdf
	Dustin, Elfriede. "The Software Trustworthiness Framework". 30 January 2007. Accessed 11 December 2007 at: http://www.veracode.com/Weblog/?p=22
Secure Software Engineering (S2e)	Schneider, Thorsten. *(S2e) Integrated: Process Oriented Secure Software Development Model*. Version 1.0, 2007 [in German]. Accessed 17 December 2007 at: http://model.secure-software-engineering.com/ Schneider, Thorsten. "Secure Software Engineering Processes: Improving the Software Development Life Cycle to Combat Vulnerability". *Software Quality Professional*. Volume 8 Issue 1, December 2006. Available (with free registration) from: http://www.asq.org/pub/sqp/past/vol9_issue1/sqpv9i1schneider.pdf
Secure Tropos	Mouratidis, Haralambos and Paolo Giorgini (2007) "Secure Tropos: A Security-Oriented Extension of the Tropos Methodology". *International Journal of Software Engineering and Knowledge Engineering*, Volume 17 No. 2, April 2007, pages 285-309. Accessed 25 August 2008 at: http://www.dit.unitn.it/~pgiorgio/papers/IJSEKE06-1.pdf

Table 2:-*Security implication of Agile Manifesto core principles*

	Core Principle	Implication	Explanation
1	The highest priority of agile developers is to satisfy the customer. This is to be achieved through early and continuous delivery of valuable software.	Obstructive	Unless the customer is highly security-aware. Security testing, if done at all, will probably be inadequate unless (1) security is an explicit, high-priority customer requirement; (2) the customer is willing to delay "early delivery" to ensure that sufficient time is given to specifying, verifying, and testing security requirements.
2	Agile developers welcome changing requirements, even late in the development process. Indeed, agile processes are designed to leverage change to the customer's competitive advantage.	Obstructive	Unless the customer is willing to allow the necessary time to assess the security impact of each new/changing requirement, and to add or change the security constraint requirements and risk mitigations associated with each functional requirement.
3	Agile projects produce frequent working software deliveries. Ideally, there will be a new delivery every few weeks or, at most, every few months. Preference is given to the shortest delivery timescale possible.	Obstructive	Unless the customer prioritizes the need for security higher than the need for rapid delivery.
4	The project will be built around the commitment and participation of motivated individual contributors.	Neutral	Could be obstructive if the individual contributors either resist or are ignorant of security priorities.
5	Customers, managers, and developers must collaborate daily, throughout the development project.	Neutral	Could be contributory if the development team includes include security experts and the customer team includes security stakeholders (e.g., risk managers).
6	Agile developers must have the development environment and support they need.	Neutral	Could be contributory if the development environment includes tools, platforms, processes, and practices expressly intended to produce secure software.
7	Both management and customers will trust developers to get the job done.	Obstructive	Unless the developers are strongly committed and able to ensure (1) their own security knowledge; (2) security practices and checkpoints in their life cycle process, and security tools in their development toolkit.
8	The most efficient and effective method of conveying information to and within a development team is through face-to-face communication.	Obstructive	The assurance process for software is predicated on documented evidence that can be independently assessed by experts outside of the software project team.
9	The production of working software is the primary measure of success.	Obstructive	Unless "working" means not just "functionally correct" but also "dependable, trustworthy, and resilient". If "working" is purely a matter of functional correctness, agile testing cannot allow for vulnerability scanning, penetration testing, or any other non-functional security tests.

RESULTS & DISCUSSION

Research Methodology

Research Instrument: Questionnaire
Sample Size considered: 253
Rejected sample: 20
Type of Respondents : Software Engineers from SME's in Bengaluru
Duration of data Collection 6 Months
Tools used: IBM SPSS
Statistical Tests Applied: CORRELATION

Table 3:-*Abbreviation for variables for correlation*

ABBREVIATION	VARIABLE NAME
RQ 1	Age group
RQ 2	Total experience (in years)
RQ 3	Specify your Role in the software team
RQ 4	Specify your experience only in one particular project at a time
RQ 5	As per your experience rate various reasons due to which the possibility of bug arrival you have encountered, (Rate the from 1 to 5 where 1 is the least possibility and 5 expresses the maximum possibility) - Number of developers
RQ 6	Depth of inheritance(DIT)
RQ 7	Weighted methods per class (WMC)
RQ 8	Code complexity(Complexity)
RQ 9	Coupling between objects (CBO)
RQ 10	Change in code
RQ 11	File or Class size (LoC)
RQ 12	Lack of Cohesion of Methods (LCOM)
RQ 13	Number of previous Bugs

RQ 14	Less number of planned test cases
RQ 15	Number of modified lines
RQ 16	Determining ownership (which is often unclear)
RQ 17	More number of revisions(releases)
RQ 18	Uncovered Problem
RQ 19	Less number of planned milestones
RQ 20	Uncover problems
RQ 21	Less potential risk
RQ 22	Response from Messages (RFC)
RQ 23	Work flow
RQ 24	Unmovable development deadlines
RQ 25	Involvement of many developers
RQ 26	Change of developers in every release
RQ 27	Experience of the developer
RQ 28	Number of different developers who modified the file in all releases
RQ 29	Number of different developers who modified the file in previous releases
RQ 30	Number of different developers who modified the file for the first time in previous releases and in the next release developers was different
RQ 31	Organization has up to date technology and processes for security
RQ 32	The physical facilities are visually appealing and secure
RQ 33	The employees are well groomed, background checked and security aware
RQ 34	The security controls of physical facilities are in keeping with the kind of service provided
RQ 35	When the organization promises to do something (eg additional controls for security) by a certain time, they do so
RQ 36	When the customers have a problem (incident or security control related) the organization shows a sincere interest in solving it
RQ 37	The organization is dependable
RQ 38	They adhere to meeting security services (physical, network, application, people as required contractually) at the times they promise to do so
RQ 39	They provide error free security reports and records in a secure manner
RQ 40	They communicate to customers exactly when the security services will be performed
RQ 41	Employees / associates give prompt and secure services to customers
RQ 42	Employees / associates are always willing to help customers in matters relating to security
RQ 43	Employees / associates are never be too busy to respond to customers' requests on matters relating to security
RQ 44	The behavior of employees / associates consistently instills confidence in customers with respect to security
RQ 45	Customers feel safe in transacting business with the employees / associates
RQ 46	Employees / associates are consistently courteous and firm with respect to security processes, with customers
RQ 47	Employees / associates have the requisite security domain knowledge to do their job well and keep their knowledge regularly updated
RQ 48	The organization gives each customer individual attention as warranted with respect to security
RQ 49	The organization does have operating hours as per the convenience of the customers in matters related to security
RQ 50	The organization has employees / associates who give personal attention to customers in matters related to security
RQ 51	The organization has customers best interests regarding security at heart
RQ 52	The employees / associates of the organization understand the specific security needs / regulatory requirements of their customers

Table 4: *correlation for 25 variables*

		RQ1	RQ2	RQ3	RQ4	RQ5	RQ6	RQ7	RQ8	RQ9	RQ10	RQ11	RQ12	RQ13	RQ14	RQ15	RQ16	RQ17	RQ18	RQ19	RQ20	RQ21	RQ22	RQ23	RQ24	RQ25
RQ1	PC	1	.969**	.875**	.846**	-.172**	-.334**	-.307**	-.555**	-.324**	-.174**	0	-.127*	.257**	.340**	0	0	.846**	.303**	.623**	0	0	.846**	.248**	.335**	-.209**

	Sig.		0	0	0	0	0	0	0	0	0	1	0	0	0	1	0	0	0	0	1	1	0	0	0	0
	N	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	235	253	253	253	253
RQ2	PC	.969**	1	.924**	.870**	-.147*	-.345**	-.319**	-.621**	-.279**	0	0	-.158*	.198**	.454**	0	0	.784**	.286**	.540**	.139*	0	.784**	.185**	.447**	-.278**
	Sig.	0		0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0
	N	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	235	253	253	253	253
RQ3	PC	.875**	.924**	1	.786**	-.257**	-.400**	-.245**	-.583**	-.169**	.129*	0	0	.266**	.394**	-.148*	0	.718**	.126*	.437**	0	0	.708**	0	.348**	-.450**
	Sig.	0	0		0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0
	N	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	235	253	253	253	253
RQ4	PC	.846**	.870**	.786**	1	0	0	0	-.510**	-.174**	-.177**	-.373**	-.443**	0	.593**	0	.209**	.590**	.510**	.660**	.425**	.274**	.699**	.294**	.632**	-.354**
	Sig.	0	0	0		1	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0
	N	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	235	253	253	253	253
RQ5	PC	-.172**	-.147*	-.257**	0	1	.580**	.516**	.393**	0	0	-.399**	0	0	0	.171**	.470**	-.476**	.396**	0	.477**	-.176**	0	.214**	.170**	.663**
	Sig.	0	0	0	1		0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0
	N	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	235	253	253	253	253
RQ6	PC	-.334	-.345	-.400	0	.580**	1	.799**	.794**	.266**	.140*	-.472	-.344	0	0	-.288	.237**	-.304	0	0	.512**	0	-.215	-.161	0	.191**

		**	**	**								**	**			**		**					**	*		
	Sig.	0	0	0	0	0		0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0
	N	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	235	253	253	253	253
RQ7	PC	-.307**	-.319**	-.245**	0	.516**	.799**	1	.609**	0	0	-.418**	-.443**	0	0	-.268**	.378**	-.275**	.199**	0	.457**	0	-.209**	-.152*	0	.178**
	Sig.	0	0	0	0	0	0		0	0	1	0	0	0	1	0	0	0	0	1	0	0	0	0	0	0
	N	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	235	253	253	253	253
RQ8	PC	-.555**	-.621**	-.583**	-.510**	.393**	.794**	.609**	1	.372**	.395**	0	0	.168**	-.400**	-.410**	-.140*	-.435**	-.333**	-.346**	0	0	-.426**	-.331**	-.416**	.298**
	Sig.	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
	N	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	235	253	253	253	253
RQ9	PC	-.324**	-.279**	-.169**	-.174**	0	.266**	0	.372**	1	.523**	0	0	-.369**	-.269**	0	-.398**	-.364**	-.234**	-.329**	0	0	-.438**	-.206**	0	-.331**
	Sig.	0	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	N	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	235	253	253	253	253
RQ10	PC	-.174**	0	.129*	-.177**	0	.140*	0	.395**	.523**	1	0	.505**	.296**	-.180**	-.337**	-.412**	0	-.530**	-.130*	-.195**	.392**	0	-.407**	-.190**	-.304**
	Sig.	0	0	0	0	0	0	1	0	0		0	0	0	0	0	0	0	0	0	0	0	1	0	0	0
	N	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	235	253	253	253	253
RQ11	PC	0	0	0	-.37	-.39	-.47	-.41	0	0	0	1	.540	0	-.38	-.26	-.59	.207	-.54	-.28	-.78	0	0	-.32	-.75	0

					3**	9**	2**	8**					**		6**	1**	7**	**	6**	5**	8**			1**	8**	
	Sig.	1	0	1	0	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	1	0	0	0
	N	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	235	253	253	253	253
RQ12	PC	-.127*	-.158*	0	-.443**	0	-.344**	-.443**	0	0	.505**	.540**	1	.415**	-.532**	0	-.516**	0	-.585**	-.228**	-.746**	0	0	-.198**	-.528**	.191**
	Sig.	0	0	0	0	1	0	0	0	0	0	0		0	0	0	0	0	0	0	0	1	0	0	0	0
	N	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	235	253	253	253	253
RQ13	PC	.257**	.198**	.266**	0	0	0	0	.168**	-.369**	.296**	0	.415**	1	-.365**	-.148*	0	.273**	-.154*	0	-.395**	0	.273**	0	-.130*	.313**
	Sig.	0	0	0	1	0	0	0	0	0	0	0	0		0	0	1	0	0	1	0	1	0	0	0	0
	N	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	235	253	253	253	253
RQ14	PC	.340**	.454**	.394**	.593**	0	0	0	-.400**	-.269**	-.180**	-.386**	-.532**	-.365**	1	-.205**	.293**	.298**	.165**	.307**	.630**	.249**	.298**	-.165**	.679**	-.317**
	Sig.	0	0	0	0	0	1	1	0	0	0	0	0	0		0	0	0	0	0	0	0	0	0	0	0
	N	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	235	253	253	253	253
RQ15	PC	0	0	-.148*	0	.171**	-.288**	-.268**	-.410**	0	-.337**	-.261**	0	-.148*	-.205**	1	.569**	-.166**	.704**	.326**	0	0	0	.849**	.367**	.353**
	Sig.	1	1	0	1	0	0	0	0	0	0	0	0	0	0		0	0	0	0	0	1	1	0	0	0
	N	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	235	253	253	253	253
RQ1	PC	0	0	0	.20	.47	.23	.37	-.1	-.3	-.4	-.5	-.5	0	.29	.56	1	0	.80	.44	.66	-.2	.12	.57	.60	.49

6					9**	0**	7**	8**	40*	98**	12**	97**	16**		3**	9**			1**	4**	5**	05**	6*	7**	7**	6**
	Sig.	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0		1	0	0	0	0	0	0	0	0
	N	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	235	253	253	253	253
RQ17	PC	.8466**	.7844**	.7188**	.5900**	-.4766**	-.3044**	-.2755**	-.4355**	-.3644**	0	.2007**	0	.2733**	.2988**	-.1666**	0	1	0	.6625**	-.1633**	0	.7944**	0	0	-.3133**
	Sig.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1		0	0	0	1	0	0	0	0
	N	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	235	253	253	253	253
RQ18	PC	.3003**	.2866**	.1266*	.5110**	.3966**	0	.1999**	-.3333**	-.2344**	-.5330**	-.5466**	-.5855**	-.1544*	.1655**	.7044**	.8001**	0	1	.5900**	.5755**	0	.2533**	.8200**	.5966**	.2443**
	Sig.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0	1	0	0	0	0
	N	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	235	253	253	253	253
RQ19	PC	.6223**	.5440**	.4367**	.6660**	0	0	0	-.3466**	-.3299**	-.1330*	-.2855**	-.2288**	0	.3007**	.3266**	.4444**	.6255**	.5900**	1	.1833**	.2200**	.8339**	.5007**	.3533**	0
	Sig.	0	0	0	0	0	1	1	0	0	0	0	0	1	0	0	0	0	0		0	0	0	0	0	0
	N	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	235	253	253	253	253
RQ20	PC	0	.1395*	0	.4255**	.4777**	.5112**	.4557**	0	0	-.1955**	-.7888**	-.7466**	-.3955**	.6300**	0	.6655**	-.1633**	.5755**	.1833**	1	0	0	.1455*	.7499**	0
	Sig.	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0		1	0	0	0	0
	N	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	235	253	253	253	253
RQ	PC	0	0	0	.2	-.	0	0	0	0	.3	0	0	0	.2	0	-.	0	0	.2	0	1	0	.1	.2	-.

21					74**	176**					92**				49**		205**			20**				52*	38**	478**
	Sig.	1	1	0	0	0	0	0	0	0	0	0	1	1	0	1	0	1	1	0	1		0	0	0	0
	N	235	235	235	235	235	235	235	235	235	235	235	235	235	235	235	235	235	235	235	235	235	235	235	235	235
RQ22	PC	.846**	.784**	.708**	.699**	0	-.215**	-.209**	-.426**	-.438**	0	0	0	.273**	.298**	0	.126*	.794**	.253**	.839**	0	0	1	.216**	.191**	-.153*
	Sig.	0	0	0	0	0	0	0	0	0	1	1	0	0	0	1	0	0	0	0	0	0		0	0	0
	N	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	235	253	253	253	253
RQ23	PC	.248**	.185**	0	.294**	.214**	-.161*	-.152*	-.331**	-.206**	-.407**	-.321**	-.198**	0	-.165**	.849**	.577**	0	.820**	.507**	.145*	.152*	.216**	1	.435**	.349**
	Sig.	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		0	0
	N	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	235	253	253	253	253
RQ24	PC	.335**	.447**	.348**	.632**	.170**	0	0	-.416**	0	-.190**	-.758**	-.528**	-.130*	.679**	.367**	.607**	0	.596**	.353**	.749**	.238**	.191**	.435**	1	0
	Sig.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0		1
	N	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	235	253	253	253	253
RQ25	PC	-.209**	-.278**	-.450**	-.354**	.663**	.191**	.178**	.298**	-.331**	-.304**	0	.191**	.313**	-.317**	.353**	.496**	-.313**	.243**	0	0	-.478**	-.153*	.349**	0	1
	Sig.	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	
	N	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	253	235	253	253	253	253

From the above table of correlation it can be observed that most significant relationships are marked and can be noted.

CONCLUSION

Creation and Use of a versatile, result situated procedure is fundamental for the achievement of any testing venture. Client will get an away from of the need, criticality, timetables and dangers related with business and operational reequip Creation and Use of a versatile, result arranged procedure is basic for the achievement of any testing venture. Client will get an away from of the need, criticality, courses of events and dangers related with business and operational necessities of the client, client s of client, and client of the item and perform testing to guarantee quality from supernatural, client, worth, procedure, and item points of view regents of the client, client s of client, and client of the item and perform testing to guarantee quality from supernatural, client, worth, procedure, and item points of view.

REFERENCES

1. Pareek, P. K., Nandikolmath, T. V., & Gowda, P. (2012). FMEA Implementation in a Foundry in Bangalore to Improve Quality and Reliability. International Journal of Mechanical Engineering and Robotics Research, 1(2), 81-87.
2. Nandikolmath, T., Pareek, P. K., & SA, V. K. (2012). "Implementation of a Lean model for carrying out value stream mapping in manufacturing industry", International Journal of Mechanical Engineering and Robotics Research, 1, no. 2, 88-95.
3. Nandikolmath, T., Pareek, P. K., & SA, V. K. (2012). "Implementation of a Lean model for carrying out value stream mapping in manufacturing industry", International Journal of Mechanical Engineering and Robotics Research, 1, no. 2, 88-95.
4. Piyush Kumar Pareek, Dr.Praveen Gowda, et al' Ergonomics in a Foundry in Bangalore to improve productivity', International Journal of Engineering and Social Science, ISSN: 2249- 9482, Volume 2, Issue 5 (May 2012), pp 1-6.
5. Sandhya Soman and Dr.Piyush Kumar Pareek 2020 J. Phys.: Conf. Ser. 1427 012010
6. PK Pareek, Optimization of the critical parameters affecting the fuel lid performance,– 2019, 2019-28-2413
7. Dr. Piyush Kumar Pareek, ROC Structure Analysis of Lean Software Development in SME's Using Mathematical CHAID Model (May 17, 2019)
8. KD Menon, A Raj Jain, Dr.Piyush Kumar Pareek – 2019, Quantitative Analysis of Student Data Mining ,
9. Fast and Efficient Parallel Alignment Model for Aligning both Long and Short Sentences S HS, S Soman, Dr.Piyush Kumar Pareek - 2019
10. MR Suresh, PC Behera, C Dash, PK Pareek, Face Recognition with Convolutional Neural Network, Journal of Advance Research in Mobile Computing 1 (1)
11. A Pai, VS Veesam, BS Babu, Piyush Kumar Pareek, SIX SIGMA APPROACHES USED IN IMPLEMENTING IN SUPPLY CHAIN MANAGEMENT: A REVIEW , Research and Applications of Web Development and Design 1 (2), 12-16
12. S Vikas, GV Attimarad, P Pareek, Implementation of a Low-Cost and Non-invasive System for the Measurement and Detection of Faulty Streetlights , Journal of Advancement in Electronics Design 1 (1), 19-30
13. Piyush Kumar Pareek, Questionnaire Survey using CHI-Square Test in Six Sigma in SME's in Bengaluru", Advancement in Image Processing and Pattern Recognition 1 (1), 20-24

14. Piyush Kumar Pareek, Analysing Tools in Six Sigma in SME's in Bengaluru , Journal of Advancement in Software Engineering and Testing 1 (1), 19-29
15. Piyush Kumar Pareek, SIX SIGMA APPROACHES USED IN IMPLEMENTING IN SUPPLY CHAIN MANAGEMENT: A REVIEW, Journal of Advancement in Software Engineering and Testing 1 (1), 14-18
16. A Pai, VS Veesam, Piyush Kumar Pareek, BS Babu, Challenges in SME's ANOVA ANALYSIS PART-2 in Bengaluru , Research and Reviews: Advancement in Robotics 1 (1), 9-15
17. A Pai, VS Veesam, BS Babu, Piyush Kumar Pareek, ANOVA Analysis Part One of Challenges in SME'S in Bengaluru, Research and Reviews: Advancement in Robotics 1 (1), 1-8
18. A Pai, VS Veesam, BS Babu, Piyush Kumar Pareek, ANOVA Analysis Part One of Challenges in SME'S in Bengaluru, Research and Reviews: Understanding the Adaptability of SME'S in Bengaluru, Research and Reviews: Advancement in Robotics 1 (1), 16-22
19. A Pai, VS Veesam, BS Babu, Piyush Kumar Pareek, ANOVA Analysis Part One of Challenges in SME'S in Bengaluru, Research and Reviews: Comparative Analysis of Conventional Approach and Automated Approach Used in Lean Six Sigma While Implementing in Supply Chain Management: A Review, Research and Applications of Web Development and Design 1 (1), 7-13
20. D Chandramma, Piyush Kumar Pareek, ANOVA Analysis Part One of Challenges in SME'S in Bengaluru, Research and Reviews:, Fast and Accurate Parts of Speech Tagging for Kannada-Telugu Pair, International Journal of Applied Engineering Research 13 (10), 7857-7867
21. Piyush Kumar Pareek, ANOVA Analysis Part One of Challenges in SME'S in Bengaluru, Research and Reviews: K Swathi, P Shetteppanavar, An efficient machine translation model for Dravidian language , 2017 2nd IEEE International Conference on Recent Trends in Electronics
22. PK Pareek, An adoptive Model for lean software development in small and medium level firms in Bengaluru, 2016
23. KV Rao, R Balakrishna, HA Pai, Piyush Kumar Pareek, Data Mining for Healthy Tomorrow with the Implementation of Software Project Management Technique, Artificial Intelligence and Evolutionary Computations in Engineering Systems
24. Piyush Kumar Pareek Dr. AN Nandakumar,'Lean software development Survey on Benefits and challenges in Agile and Lean usage in small and medium level firms in Bangalore', International Journal of Advanced Research in Computer Science and Software
25. RR Hunnur, B Vyas, S Sudarshan, JM Mathad, Piyush Kumar Pareek , A study on job stress for school teachers, Journal of Business and Management 7 (4), 42-44
26. PK Pareek, DP Gowda , 'Ergonomics in a Foundry in Bangalore to improve productivity', International Journal of Engineering and Social Science, ISSN, 2249-9482
27. T Nandikolmath, Piyush Kumar Pareek, Implementation of a Lean Model for carrying out value stream mapping in a manufacturing industry, International Journal of Mechanical Engineering and Robotics Research
28. Piyush Kumar Pareek, TV Nandikolmath, P Gowda, FMEA implementation in a foundry in bangalore to improve quality and

reliability, International Journal of Mechanical Engineering and Robotics Research
29. Piyush Kumar Pareek, Education Data Mining–Perspectives of Engineering Students , International Journal of Innovative Research in Computer Science
30. Piyush kumar Pareek, DVK SA, Implementation of a Lean Model for Carrying out Value Stream Mapping in a Manufacturing Industry', International Journal of Mechanical Engineering and Robotics Research
31. Manan Bakshi , Piyush kumar Pareek, DNA Computing, International Journal Of Engineering Research and Technology (IJERT)
32. Piyush kumar Pareek, 'Reduction of Cycle Time By Implementation of a Lean Model Carried Out In a Manufacturing Industry', International Journal of Engineering and Social Science, ISSN, 2249-9482
33. L Bhargav, R Anu, D Nagaraj, HU Lavanya, PK Pareek, Dynamic Resolution Of Image Edge Detection Technique Among Sobel, Log, And Canny Algorithms
34. Piyush Kumar Pareek, Domestic LPG Comparative Study Between Urban and Rural Markets
35. Piyush Kumar Pareek, Domestic LPG Marketing in Indian Perspective
36. Piyush Kumar Pareek, Survey on Challenges in Devops, International Journal of Innovative Research in Computer Science
37. A Pai, BN Ramesh, PK Pareek, P Prasoon, Failure Mode Effective Analysis for Software Processes
38. Piyush Kumar Pareek, A survey on approaches for predicting performance of students, International Journal of Engineering Research and Science
39. Piyush Kumar Pareek, Identifying Wastes in software, International Journal of Engineering Studies and Technical Approach
40. Failure Mode Effective Analysis of Requirements Phase in small software Firms', Paper ID: ICSTM
41. PK Pareek, DAN Nandakumar, YMCA/2015/292, International Conference on Science