Journal of Professional & Applied Psychology *Original Article*

Understanding Agile Practices for Job Satisfaction through Job Characteristics

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Abstract

Usage of Agile Practices draws the attention to the adoption of these agile methods because of their significant contributions to high software quality and job benefits. Therefore, the purpose of this research was to look at the role of job characteristics in mediating the relations between agile practices; project management (PM), and software development approaches (SDA) and job satisfaction. Sample was 486 professionals working in the companies incorporating agile practices, to whom an online survey was administered during period of September 2021 using the Google Forms platform. Findings affirmed the claims that agile PM and SDA practices made professionals more satisfied with their jobs and this impact has been found further mediated by job characteristics. Results indicated that job characteristics like job autonomy and feedback mediated the agile PM practices and job satisfaction. While agile SDA practices and job satisfaction were explained significantly by all job characteristics i.e., feedback, task significance, skill variety, autonomy, and task identity. This study offers insights into agile approaches in project management and software development. This research reveals beneficial aspects of agile practices that influence job satisfaction in work environment.

Keywords: Agile Practices, Agile Project Management, Agile Software Development, Job Autonomy, Job Characteristics, Job Satisfaction

Received: 04 March 2022; Revised Received: 14 April 2022; Accepted: 15 May 2022

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Introduction

The innovative practices of agile has a strong impact on the IT field and change management. The adoption of agile methodology has not only impacted the speed of delivery but has produced favorable results in the motivation of the workforce and their productivity with increasing success and minimized error rates. In contrast to traditional software development, which aims to decide the whole specification at the beginning of the project, the agile development method facilitates later revisions to requirements through gradual improvements in short cycles (Balijepally et al., 2006). The ability to react expediently to the changes in the market and customer needs is referred to as agility (Lee & Xia, 2010).

Agile methodologies suggest a variety of practices that might have an impact on job characteristics. Development team members consider methods as a toolbox from which they can choose as required, thus we value practices above methods (Conboy & Fitzgerald, 2010). There are two sorts of agile development practices: agile software development and agile project management (Tripp & Armstrong, 2014).

In recent years, the agile development of software has evolved as the alternative to the

complex software development or plan-driven approach. The principal agile project characteristics are (Abrahamsson et al., 2002): the program begins with a product which is minimally viable, and step by step progress starts; developers work closely with consumers; the work method is easy to understand and to use; and the procedure of software creation is flexible and open to the later changes in software.

Majority of agile project management methodologies were developed with the software companies and its usefulness in the field is undisputed. However, the core principles of agile can still be adopted in project management. Agile PM approach is a collective, reiterative project management strategy that stresses regular evaluation and changeability (McHugh et al., 2010). So, we would not want to remain limited to the technology background so if someone is developing a marketing campaign or building a bridge, agile framework is there to help. These four elements are at the center of the agile project management practices covering everything from start to finish: people and the collaboration take precedence over the processes and tools; working documentation that includes instructions and practical incidences instead of comprehensive documentation; customers are at the center of the whole system instead of being the end receiver of the product; change is at the heart of the whole process instead of following a predetermined process (Boehm & Turner, 2005).

The amount to which the respondents employ the agile PM practices identified in present research, including burndown (visual representation), daily stand-ups (daily progress), retrospective meetings (look back what went well), and iterative delivery (short delivery of plans).The amount to which the respondents employ the agile SDA identified, such as pair programming (work together), automated builds (specific test codes), continuous integration, unit testing, refactoring (upgrade outdated designs), and code standards (agreed-upon standards) (Scott et al., 2014).

The Job Characteristics Model JCM (Hackman & Oldham, 1980) was utilized in this research to examine the influence of agile methodologies on the perceptions and attitudes of employees they form regarding their employment. According to the JCM, job characteristics influence a person's thoughts about the job and behavior. The impact of agile PM and SDA methods on employee satisfaction was investigated using JCM. Considering that agile experts had already made specific assertions claiming the by-product of their practices has improved job satisfaction among members of the team, it is logical to presume that their implementation would form work perceptions.

Organizations change the nature of the work of ADT members by using practices identified in agile methods. Software developers, for example, are required to participate in activities like analytic processes and strategic planning as part of agile methodologies, which are important to accelerate employees perceived amount of work independence, skill, or work content. Furthermore, according to business and information systems research, changing job features might affect ADT members' motivation, work satisfaction, and job performance.

The Job characteristics framework is a useful tool for determining how agile approaches affect the performance of employees. The JCM identifies five work features which impact the employees' perception of the task and their attitudes towards it particularly job satisfaction (Ply et al., 2012): Task Significance is the degree to which people believe their work does have an effect on people's lives, either they are a part of society in general or an organization; Task Identity that corresponds to the scale of job responsibilities or involves the achievement of a specific result; Skill Variety wherein one sees one’s occupation as needing different

credentials, abilities, and experience; Job Autonomy in which workers have the freedom to do the necessary duties and meet the job's deadlines; Feedback which is the degree to which workers may assess their own success during the course of completing the job assignment.

The JCM was used by researchers to clarify, among other results, the job satisfaction of IT professionals (Morris & Venkatesh 2010) and the intent to turnover (Thatcher et al., 2006). Job satisfaction is an emotional consequence of job (Weiss & Kröpanzano, 1996). Characteristics of the job are closely linked to job satisfaction (Ahuja et al., 2007; Ang & Slaughter, 2001; Morris & Venkatesh, 2010; Rutner et al., 2008). JCM has been proved useful to understand job satisfaction of widespread populations of IT professionals (Dinger et al., 2015; Thatcher et al, 2006). There has been a lack of systematic research into the impact of agile approaches on employees' perceived job features and job satisfaction (Pedrycz et al., 2011).

Employment satisfaction is one of the most essential themes in today's competitive job market, as employers strive to keep turnover low in order to maintain high efficiency. Moreover, some firms are developing initiatives to attract the best personnel in the service industry by offering programs to improve job satisfaction and establish job characteristics which enhance motivation and reduce employee's burnout and ultimate departure from the company. Job satisfaction has been seen in various studies to increase efficiency, reduce the price of recruiting, and reduce the time it takes to train new staff.

With all these concerns in organizational behavior, which focuses on job characteristics and employees' satisfaction, this study offers insight into agile techniques in project management and software development. The study uncovers key aspects of agile methods that have an impact on job satisfaction. This analysis also served as a starting point for a wider debate within enterprises, and it has the potential to cause a shift in culture in the field of management strategies. There is currently limited evidence on agile approaches, particularly in Pakistan, because this managerial style is still recent, and companies are at various stages of evolution. Maintaining a larger investigation will help companies to analyze the advantages of agile across the board.

We have built a conceptual model to explore this concern, which relates agile practices to the satisfaction of agile development team members. Preliminary research into using agile techniques has observed that agile team participants are more satisfied (Melnik & Maurer, 2006) and motivated than traditional team participants (McHugh & Lang, 2011).

Figure 1 *Hypothesized Model for Mediation through Job Characteristics*

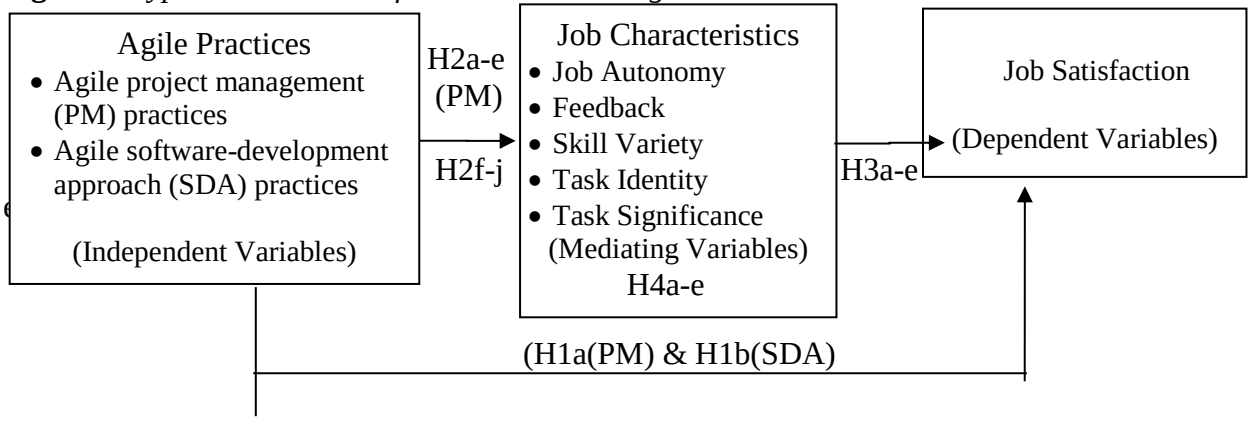

Figure 1 presents our research model of the mediation impact of job characteristics on the relationship of job satisfaction with agile practices. The reasoning set out in the previous parts of this review and current research is used in our proposed model. Our first generation of hypotheses has been widely assessed in research (Morris & Venkatesh, 2010; Thatcher et al., 2006). The assumptions are included to connect our framework to the existing theoretical context of IT workers (Joseph et al., 2007).

Hypotheses of the Study

H1a-b: The degree to which agile PM and SDA methods are implemented would positively impact job satisfaction.

H2a-b: The degree to which agile PM(a-e) and SDA(f-j) practices are used would have a positive effect on job characteristics of a) job autonomy, b) feedback, (c) skill variety, (d) task identity, (e) task significance.

H3a-e: Job characteristics; a) feedback, (b) skill variety, (c) task identity, (d) task significance and (e) job autonomy will be positively linked with job satisfaction.

H4a-e: The extents of usage of agile PM and SDA practices will get a positive interaction effect on job satisfaction through job characteristics.

Method

Participants

The respondents of this study were the professionals (*N*=486) working in project management teams and software development teams in various organizations where Agile framework is adopted. They were approached through LinkedIn, Slack channels, and other online methods using purposive sampling technique. The inclusion criteria were (1) their working as member of an agile team and (2) are not involved in traditional management roles in the team, (3) moreover, participants were screened out on the basis of their experience having more than one year, and (4) their working duration at current organization is at least six months. Demographic variables were recorded on personal and organizational levels.

Instruments

Following instruments were used for survey data collection after assuring the satisfactory psychometric properties in terms of reliability and validity:

Agile Practices Questionnaire

Agile practices were measured using a questionnaire developed by Tripp et al. (2016). This 31-items questionnaire measures two categories of agile practices namely 1) Agile Project Management (PM) Practices, 2) Agile Software Development Approach (SDA) Practices. Agile PM practices measures four types of practices including Burndown (3-items), Iterative delivery (4-items), Daily stand-up meeting (3-items), and Retrospective (3-items), and Agile SDA practices measures six practices including Unit testing (3-items), Continuous integration (3-items), Automated build (3-items), Coding standards (3-items), Refactoring (3-items), and Pair programming (3-items). Responses were obtained on a seven-point Likert scale categorizing as "strongly disagree" scored 1 to "strongly agree" scored 7 and "don't know" as an 8th option if any question does not apply on the respondent. The higher the score obtained on each agile practice of the scale indicates the high degree of practice of respective agile technique. The alpha reliability coefficient of this scale is .81 and .79 for PM and SDA respectively.

Job Characteristics Model Scale

To measure the job characteristics, a somewhat altered version from the Hackman & Oldham's (1980) scales as used by Morris and Venkatesh (2010), was used in this research. This scale measures 5 job characteristics with 16 items: feedback (3-

items), job autonomy (4-items), skill variety (3-items), task identity (3-items) and task significance (3-items). Respondents provided their responses on a seven-point Likert scale wherein 1 show "strongly disagree" and 7 indicates "strongly agree". The higher score on each characteristic is indicative of high degree of existence of that job characteristics. Alpha coefficient stayed .78 for this scale.

Job Satisfaction Scale

To measure the job satisfaction, a 3-item scale which is a little revised form of the Hackman & Oldham's (1980) scale and had been used by Morris and Venkatesh (2010) in their study was used in the current research. A 7-point Likert scale was used to collect responses on items ranging from "strongly disagree" to "strongly agree". The higher the score on scale shows high level of job satisfaction. Reliability alpha was .86.

Procedure

This study has undergone Ethics Review Board of The Islamia University of Bahawalpur, Pakistan. Survey research design has been followed in the present study to collect the data from the software professionals and project managers working in different companies using agile practices for their projects. Through purposive sampling technique, the recruitment of sample was made. Respondents were approached online using contacts from companies working on agile practices. Institutional and personal consents were obtained for participation in this survey research. After obtaining permission, a booklet (in a google form) consisting of questionnaires measuring all study variables along with a demographic variables sheet were given to the respondents of the study. Clear instructions about how to respond the items on each questionnaire were provided to the participants. They were assured about the confidentiality of their responses provided on questionnaire that the information sought from them will only be used for research purpose.

Results

Correlation analysis was performed to examine the relationships of agile PM and SDA practices with five core job characteristics and job satisfaction (Table 1). Mediation analyses through job characteristics between agile practices (PM and SDA) and job satisfaction were computed through process macro using SPSS-21 (Table 2 & 3).

Table 1

Study Variables Correlations and Descriptive Statistics (N=486)

		M	SD	1	2	3	4	5	6	7
Agile Practices										
1	Agile PM	72.23	10.17	1						
2	Agile SDA	81.18	7.44	.14*	1					
Job Characteristics										
3	Job Autonomy	22.33	5.15	.36**	.48*	1				
4	Feedback	16.18	3.88	.31**	.38**	.17*	1			
5	Skill Variety	17.23	3.92	.16*	.31**	.12*	.26**	1		
6	Task Identity	15.91	5.33	.22**	.35**	.12*	.15*	.14*	1	
7	Task Significance	18.62	4.56	.13*	.39**	.15*	.27**	.22**	.14*	1
Job Outcome										
8	Job Satisfaction	19.04	1.20	.25**	.46**	.18*	.17*	.12**	.16*	.19*

*p>.05, **p>.001

Table 1 indicates the descriptive and correlation analyses among study variables. Findings provided through mean and *SD* the high scores on agile SDA practices than PM practices among professionals. Findings further revealed the significant connections of agile practices with all job characteristics and job satisfaction. Results indicated that autonomy and job feedback are even more closely linked to agile PM approaches while SDA are found more correlated with all five core characteristics and job satisfaction.

Table 2

Total, Direct and Indirect Effects of Agile PM Practices on Job Satisfaction (N=486)

	Paths	**Effect**	**Coeff**	**BootSE**
	Agile PM on JS	Total effect	.19**	.02
Mediators		Direct effect	.13**	.02
	Agile PM on JS	Indirect effect	.07	.01
Job Autonomy	through Job	Partially indirect effect	.006	.001
	Autonomy	Complete indirect effect	.07*	.01
	Agile PM on JS	Indirect effect	.05	.01
Feedback	through	Partially indirect effect	.006	.001
	Feedback	Complete indirect effect	.05*	.01
	Agile PM on JS	Indirect effect	.001	.01
Skill Variety	through Skill	Partially indirect effect	.000	.001
	Variety	Complete indirect effect	.001	.01
	Agile PM on JS	Indirect effect	.000	.01
Job Identity	through Job	Partially indirect effect	.000	.001
	Identity	Complete indirect effect	.000	.01
	Agile PM on JS	Indirect effect	.000	.01
Job Significance	through Job	Partially indirect effect	.000	.001
	Significance	Complete indirect effect	.000	.01

*$p < 0.05$, **$p < 0.01$

The significant findings given in Tables 1 were evaluated using a process macro to check the mediation effects of five job characteristics on the relations among agile PM and SDA practices and job satisfaction. Findings indicated that agile PM and SDA practices predicted job satisfaction significantly; findings also reported that agile practices of PM and SDA significantly predicted the job characteristics.

Findings pertaining to agile PM practices (Table 2) revealed that job characteristics like autonomy and feedback significantly mediated effects of agile PM practices on job satisfaction. Analyses of total and direct effects of agile PM practices on job satisfaction are significant. Results regarding the indirect effects from feedback and job autonomy for relationships of PM with job satisfaction demonstrated significant mediation between PM and criterion variable.

Table 3
Total, Direct and Indirect Effects of Agile Practices SDA on Job Satisfaction (N=486)

	Paths	Effect	Coeff	BootSE
Mediators	Agile SDA on JS	Total effect	.21**	.02
		Direct effect	.13**	.02
Job Autonomy	Agile SDA on JS through Job Autonomy	Indirect effect	.02	.01
		Partially indirect effect	.004	.001
		Complete indirect effect	.02*	.01
Feedback	Agile SDA on JS through Feedback	Indirect effect	.03	.01
		Partially indirect effect	.002	.001
		Complete indirect effect	.03*	.01
Skill Variety	Agile SDA on JS through Skill Variety	Indirect effect	.02	.01
		Partially indirect effect	.001	.001
		Complete indirect effect	.02*	.01
Job Identity	Agile SDA on JS through Job Identity	Indirect effect	.01	.01
		Partially indirect effect	.002	.001
		Complete indirect effect	.03*	.01
Job Significance	Agile SDA on JS through Job Significance	Indirect effect	.01	.01
		Partially indirect effect	.000	.001
		Complete indirect effect	.02*	.01

*$p < 0.05$, **$p < 0.01$

Findings pertaining to agile SDA practices (Table 3) revealed that job characteristics of job autonomy, feedback, skill variety, job identity, and job significance significantly mediated the effects of agile SDA practices on job satisfaction. Analyses of total and direct effects of agile SDA practices on job satisfaction are significant. Findings regarding indirect effects from all five job characteristics for the relationships of SDA with job satisfaction demonstrated significant mediation between SDA and criterion variable.

Discussion

Agile provides a progressive and iterative development approach. Agile methods of software development have been used widely over the last three decades and a recent Forrester survey indicates that the majority of organizations have now embraced them in some respect (West et al., 2010). The advocates of agile approaches made two clear assumptions on the effects of their use. First, the methods deliver superior software. This reasoning has been thoroughly investigated and the effect of some agile methods on project accomplishment has been exhibited. The second key reasoning of agile professionals is the motivation and satisfaction of the people who work in agile teams. They argue, in fact, that "people want to work there" when agile approaches are used (Highsmith, 2002). Although preliminary investigations into job satisfaction have been conducted to check the effect of specific agile methods, but the research into this argument for agile impacts on job satisfaction is still ongoing, and researchers have rarely examined through empirical observation.

Keeping the significance of use of agile practices by professionals in companies and organizations, this study was planned to investigate the usage of agile PM and SDA practices and their impacts on job satisfaction. Research findings demonstrated that professionals working in companies who

have adopted agile methodologies have been found more inclined with agile SDA practices than PM practices. Professionals who are working in project management tasks have shown higher scores on agile PM practices while the professionals of software development were found using both practices of PM and SDA.

The outcomes of this study were interpreted within the context of an organizational environment. This explicitly addresses that how agile approaches in software development and project management has improved efficiency and employee satisfaction. Simply stated, agile methods have greatly enhanced job satisfaction among both SDA and PM; nevertheless, participants in the SDA workplace setting are more satisfied than those in the PM work situation. The scores on agile PM practices were found highly correlated with job autonomy and feedback than other job characteristics while agile SDA practices were found significantly correlated with all job characteristics like autonomy, feedback, skill variety, task identity, and task significance. It shows that the professionals who are engaged with agile SDA practices experience more job satisfaction due to job characteristics. These results are consistent with Melnik and Maurer's (2006) findings in their research study. Morris and Venkatesh (2010) also reported the same findings and clearly stated that job characteristics are positively correlated with job satisfaction.

This study was focused on knowing the mediation effect through the job characteristics between agile practices and job satisfaction. Hypothesized model suggested that agile PM practices will affect job satisfaction through two job characteristics, for instance, autonomy and feedback. This assumption was supported by the findings of present study, and it was found that autonomy and feedback mediated the relationship of agile PM practices with job satisfaction. Study by Pedrycz et al. (2011) has submitted the consistent findings in this regard. Similarly, the relationships of agile SDA practices with job satisfaction were found mediated by all job characteristics in the analyses. Tripp et al. (2016) also investigated the effect of agile practices on work satisfaction and found significant roles of agile teamwork in employees' job satisfaction.

Conclusion

In summary, the study findings have proposed the meaningful bunch of predictors for job satisfaction. Findings have proved the significant role of agile practices in job satisfaction. Agile PM and SDA practices have been found associated with job characteristics and then job satisfaction. Further, research also has provided the connection among job characteristics and satisfaction. Moreover, findings have affirmed a mediating role of job characteristics between agile PM and SDA practices and job satisfaction.

Limitations and Suggestions

Regardless of valuable findings, the current research contains a number of flaws that should be identified and addressed. Firstly, all variables taken as factors of job satisfaction in the present study would have reciprocal relationships with agile practices. So, the direction of the connection between the agile practices and job characteristics is difficult to fix whether they are the determinants of job characteristics or the consequences of job characteristics. Therefore, in order to analyze the direction of variables as antecedents or consequences, a cross-lagged research design should be followed and a prospective study should be planned to check the directive relationship.

Secondly, to lend more confidence in the conclusion of present study, more literature is required for review so that a strong rationale could be established between the direction and strength of connections between agile practices, job characteristics and job satisfaction. Thirdly, hence, this study has presented simple and direct relationships of agile practices with job satisfaction, however

some moderators can also influence the direction of relation. Thus, a desire is being felt that future study should include few moderators such as personality traits, gender, age, and job experience.

Contribution of Authors

Frasat Kanwal: Conceptualization, Investigation, Methodology, Data Curation, Formal Analysis, Writing – Original Draft
Fatima Khurram: Conceptualization, Methodology, Writing- Reviewing & Editing

Conflict of Interest

There is no conflict of interest declared by authors.

Source of Funding

The authors declared no source of funding.

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