

Agile Practices and Intention to Stay: Mediation Effects Through Job Characteristics

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Abstract

Agile methods of software development have been used widely over the last decade and majority of organizations have now embraced them in their projects. Thus, the current study explored the positive influence of agile practices on individuals' intentions to stay at their employment. In accordance with this objective, the study looked at the role of job characteristics in mediating the association between agile methods and intention to stay. A sample of 486 employees was contacted through online survey using the Google Forms platforms during the period of September 2021 who practice the agile methods while working at their organizations. They provided data on the questionnaires of agile practices, job characteristics, and intention to stay. Findings postulated that agile practices have significant impact on employees' intention to stay. Results further reported the significant mediation through job characteristics between agile practices and intention to stay. Findings showed that the job when is designed on feedback, skill variety, job autonomy, task identity and task significance mediate an impact of practicing agile methods on intention to stay.

Keywords: Agile practices, Intention to stay, Job characteristics, Job autonomy

Introduction

Agile methods in 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 these methods 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

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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. When agile practices are utilized, they believe, "people want to work there" (Highsmith, 2002). Although some preliminary investigations into intention to stay have been conducted to check the effect of specific agile methods on it, research into this argument for agile impacts on intention to stay is still going on, and researchers have rarely examined through empirical observation.

The ten agile practices are listed into two categories in agile software development SDA and project management PM methods. These practices are distinctive as agile PM practices (such as daily stand-ups, burndown, iterative delivery, and retrospective meetings) and agile SDA methods (like continuous integration, pair programming, unit testing, refactoring, automated builds, and code standards) have a variety of focuses and effects on job characteristics perception. Most agile SDA activities are focused on programming. Agile PM methods, on the other hand, place a greater emphasis on clients, feedback, and team coordination. Therefore, the most critical aspects of the agile PM practices are management and help software engineering's success. With these separate focuses, agile approaches can be interpreted as two principles that are related, but distinct.

According to Petter et al., (2007); Polites et al., (2012) one needs to represent in nature each of the 10 agile practices. It's difficult to say how each group uses a practice because terminology is inconsistent across approaches and a team may claim to adopt a practice but not necessarily implement this in the similar way as the other. Likewise, the agile SDA techniques concentrate on the proper software development process whereas the agile PM practice focuses on managing job (Tripp & Armstrong, 2014).

Job Characteristics Model JCM suggests that a person's perceptions of the work and his/her actions are affected by the characteristics of the job. JCM had been utilized to investigate the impact of work design on employee satisfaction (Hackman & Oldham, 1980), the desire to turnover (Ahuja et al., 2007), and work exhaustion (Moore, 2000). The job characteristics theory establishes a link between key work features and work-related emotional reactions. Work's autonomy, skill diversity, task identity, task significance, and feedback qualities,

according to the theory, result in emotional aspects of perceived task significance, perceived responsibilities of employee's performance, and understanding for real work accomplishments. Interpersonal and occupational outcomes are influenced by such emotional factors.

Job autonomy- Employees are considered to have autonomy because they have the liberty and choice to select what to do to complete the tasks in their jobs. Feedback- If workers are given clear information on their performance is called feedback. Skill variety - The degree whereby a job necessitates the usage of certain skills. Task identity- It is achieved whenever a professional accomplishes an entire work from inception to delivery. Task significance-If one's work does have an impact on people's lives through an institution or wider community (Hackman & Oldham, 1980; Moore, 2000; Thatcher et al., 2002).

Employee retention is one of the most important indicators of a company's health. Employees take their intellectual capital, connections, and resources with them when they depart an organization (IhamiYücel, 2012). Employers who are astute never undervalue the importance of retaining talented workforce. HR policies and business strategies must be designed in such a manner that excellent employees are retained. An employee leaving an organization causes psychological suffering for both the organization and its other employees; it is not just a professional failure, but it also disrupts the social life of the organization (Deery, 2008),

In comparison to the intention to leave, the intention to stay is a positive factor. He also stated that employees' willingness to stay and work in the organization is based on their desire to stay Ruey-Dang (2008).

According to Cotton and Tuttle (1986), turnover is a person's estimated likelihood of staying or leaving his or her organization (Awang et al.). An intended and unintended permanent withdrawal from an organization has been defined as labor turnover. Measuring actual turnover behavior is difficult, but that intention to turnover is a strong and reliable predictor of actual labor turnover. The desire to quit is a direct predictor of withdrawal symptoms (Zopiatis, 2014).

Managers face a constant struggle in retaining IT experts (Moore, 2002). While global economic factors play a role in the high attrition attitude in IT, experts claim that the workplace culture and structure of IT work are the primary drivers

of turnover (Barley, 1996). When their managers fail to develop meaningful roles, IT professionals depart. This is especially true when it comes to software development (Thatcher, 2002). On the basis of job characteristics theory (Hackman & Oldham, 1980) we claim that the skill diversity, work independence, and customer involvement which agile methods provide enable program creation highly valuable.

As previously said, Tech workers who use iterative approach must acquire a larger set of skills (Beck, 2000). Software development is vital to IT workers' professional development since it allows them to share and learn a variety of skills. Work gives individuals a sense of accomplishment because it broadens their skill set, competence, and learning. They perceive software development as a valued and meaningful job. Furthermore, an agile approach allows a programmer to benefit from client encounters and direct participation (Beck, 2000). Such customer experience extends beyond the workplace, fostering personal bonds that are important to the dev team members. Additionally, the agile method allows for greater job autonomy, which provides work with more meaning.

It is proven that professions that are designed to be meaningful have an impact on workers' outputs, such as stay intentions and behaviors (Thatcher, 2006). Individuals who have meaningful work experiences are more likely to be involved with their jobs and, as a result, with their companies. We expect IT workers to link their work's perceived meaning to the organizational context because the decision to use a particular development method is still up to the organization (Valacich et al., 2017). As a result, we anticipate that using agile development would result in fewer withdrawal cognitions and a stronger intention to stay since IT professionals enjoy meaningful work.

The primary goal of software development techniques is to improve processes, such as adapting to changing customer needs, accelerating delivery process, including enhancing efficiency. Very little revealed, unfortunately, regarding why or how new agile development approaches affect individual IT professionals' outcomes. Based on principles from the agile research and job characteristics model, we hypothesize a connection among agile methodologies use and IT practitioners' and project managers' staying intentions. We observed a correlation between agile methodology and the desire to stay. In addition, JCM completely mediated the effect of agile approach on the intent to staying.

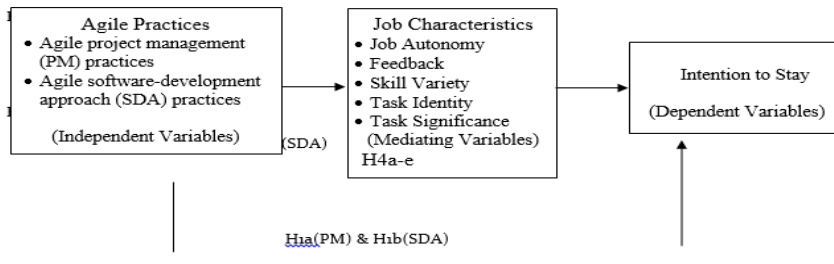
Figure 2: Hypothesized Model for Mediation through Job Characteristics

Figure 1 presents our research model of the mediation effect of job characteristics on the relationship of agile practice with intention to stay. 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 (Ahuja et al., 2007; Morris & Venkatesh, 2010; Thatcher et al., 2006). The above assumptions are included as a way to connect our framework to the existing theoretical context of IT workers (Joseph et al., 2007).

H1a-b: The degree to which agile PM and SDA methods are implemented would have a positive effect on intention to stay.

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) feedback, b) skill variety, c) job autonomy, d) task identity, and (e) task significance.

H3a-e: Job characteristics; a) feedback, b) autonomy c) task identity, d) task significance and e) skill variety will have certainly a positive link with stay intention.

H4a-e: The extents of use of agile PM and agile SDA practices will have positive interaction effects on intention to stay through job characteristics

Method

❖ Participants

The respondents of this study were the professionals who were approached through LinkedIn, Slack channels, and other online methods using purposive sampling technique. Sample size was computed after receiving initial response from the respondents using online Raosoft Inc sample size calculator. The sample size is 486 professionals in project management teams and software development

teams in various organizations where agile framework is adopted. Respondents were required to confirm that all are working as member of an agile team and are not involved in traditional management roles in the team. Moreover, participants were screened out on the basis of their experience having more than one year, and 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 and 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 using a seven-point Likert scale, responses ranged from "strongly disagree" to "strongly agree," with 1 representing "strongly disagree" and 7 representing "strongly agree" and "don't know" as an 8th option if any question does not apply on the respondent.

❖ Job Characteristics Model Scale

To measure the job characteristics, in the current investigation, a customized version of Hackman and Oldham's (1980) scales was utilized. Morris and Venkatesh (2010) also used this scale in their research. With 16 items, this scale measures five job features: feedback (3-items), skill variety (3-items), job autonomy (4-items), task significance (3-items) and task identity (3-items). Respondents provided their responses in a seven-point Likert scale in which one showed "strongly disagree" and seven indicated "strongly agree".

❖ Intention to Stay Questionnaire

Intention to stay was measured using Intention to Stay scale developed by Markowitz (2012). It is a 4-items questionnaire with a five-point Likert type scale going from 1 to 5, with 1 being "strongly disagree" and 5 being "strongly agree."

❖ Procedure

This research was conducted using a survey research design and the data were collected from the employees of different companies using agile practices for their projects. The recruitment of sample was made through purposive sampling technique using online modes. 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. Participants were contacted and briefed about the main objectives of carrying out this research in terms of risks and benefits. The consents from participants were obtained at priority. Their participation was on volunteer basis. Respondents' identity will not be disclosed to anyone at any step of the study and afterward. The information provided by them on questionnaire items were recorded confidential and is used only for research purpose

Results

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

Table 1

Analyses of Study Variables' Means, SDs, and Correlations

		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	Intention to Stay	14.32	3.10	.22**	.35**	.19*	.16*	.18**	.17*	.16*

* $p < .05$, ** $p < .001$

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 PM and SDA practices with all job characteristics and intention to stay. Agile PM techniques were shown to be more connected with autonomy and job feedback, whereas SDA methods were found to be more correlated with all 5 main job features as well as staying intent.

Job Characteristics Mediate the Relation between Agile PM and SDA Practices and Intention to Stay

The significant findings were discovered after using a process macro to assess the mediation effects of five job characteristics on the correlations among agile PM and SDA practices and intention to stay presented in Tables 1 and 2. Results indicated the significant total and direct effects of PM and SDA practices on stay intention. Findings indicated that these two types of practices predicted intention to stay significantly; findings also reported that agile practices of PM and SDA significantly predicted the job characteristics.

Table 2

Mediation through Job Characteristics indicating Total, Direct and Indirect Effects of Agile PM Practices on Intention to Stay (IS)				
	Paths	Effect	Coeff	BootSE
Mediators	Agile PM on IS	Total effect	.1702**	.0295
		Direct effect	.0543**	.0290
Job Autonomy	Agile PM on IS through Job Autonomy	Indirect effect	.0600	.0132
		Partially indirect effect	.0061	.0012
		Complete indirect effect	.0661*	.0142
Feedback	Agile PM on IS through Feedback	Indirect effect	.0402	.0132
		Partially indirect effect	.0065	.0012
		Complete indirect effect	.0467*	.0142
Skill Variety	Agile PM on IS through Skill Variety	Indirect effect	.0015	.0132
		Partially indirect effect	.0003	.0012
		Complete indirect effect	.0018	.0142

Job Identity	Agile PM on IS through Job Identity	Indirect effect	.0002	.0132
		Partially indirect effect	.0004	.0012
		Complete indirect effect	.0006	.0142
Job Significance	Agile PM on IS through Job Significance	Indirect effect	.0001	.0132
		Partially indirect effect	.0006	.0012
		Complete indirect effect	.0007	.0142

*p< 0.05, **p< 0.01

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

Table 3

Mediation through Job Characteristics indicating Total, Direct and Indirect Effects of Agile Practices SDA on Intention to Stay (IS)

	Paths	Effect	Coeff	BootSE
Mediators	Agile SDA on IS	Total effect	.2884**	.0295
		Direct effect	.1525**	.0290
Job Autonomy	Agile SDA on IS through Job Autonomy	Indirect effect	.0316	.0132
		Partially indirect effect	.0045	.0012
		Complete indirect effect	.0361*	.0142

	Agile SDA on IS through Feedback	Indirect effect	.0401	.0132
Feedback		Partially indirect effect	.0022	.0012
		Complete indirect effect	.0423*	.0142
	Agile SDA on IS through Skill Variety	Indirect effect	.0302	.0132
Skill Variety		Partially indirect effect	.0011	.0012
		Complete indirect effect	.0313*	.0142
	Agile SDA on IS through Job Identity	Indirect effect	.0116	.0132
Job Identity		Partially indirect effect	.0025	.0012
		Complete indirect effect	.0141*	.0142
	Agile SDA on IS through Job Significance	Indirect effect	.0116	.0132
Job Significance		Partially indirect effect	.0005	.0012
		Complete indirect effect	.0121*	.0142

*p< 0.05, **p< 0.01

Findings pertaining to agile SDA practices (Table 3) revealed that work characteristics of autonomy, feedback, job significance, skill variety, and task identity significantly mediated the effects of agile SDA practices on intention to stay. Analyses of total and direct effects of agile SDA practices on intention to stay are significant. Results regarding the indirect effects from job all five job characteristics for the relationships of SDA with intention to stay 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 decade 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 motivation have been conducted to check the effect of specific agile methods on it (McHugh & Lang, 2011), research into this argument for agile impacts on motivation 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 explore the usage of agile PM as well as SDA practices and their impacts on intention to stay. Results demonstrated that professionals working in companies who have adopted agile methodologies have been found more incline 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 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 five main job features like autonomy, feedback, skill variety, job identity, and job significance. It shows that the professionals who are engaged with agile SDA practices experience more job satisfaction due to job characteristics. These results are in accordance with Melnik and Maurer's (2006) observations in their data analysis. Morris and Venkatesh (2010) and Rahman (2014) also reported the same findings and clearly stated that job characteristics are positively correlated with intention to stay.

This study was focused on knowing the mediation effect through the job characteristics between agile practices and intention to stay. Hypothesized model suggested that agile PM practices will affect intention to stay through two job characteristics of job 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 intention to stay. Study by Moore (2000) has submitted the consistent findings in this regard. Similarly, the relationships of agile SDA practices with intention to stay were found mediated by all job characteristics in the analyses. VersionOne. (2011) and Rong-Chang Jou (2013) also investigated the impact of agile practices on intention to stay and found the significant roles of agile teamwork in employees' intention to stay.

Conclusion

In summary, the study findings have proposed the meaningful bunch of predictors for intention to stay. Findings have proved the significant role of agile practices in intention to stay. Agile PM and SDA practices have been found associated with job characteristics and then intention to stay. Further, study also has provided the connection among job characteristics and intention to stay. Moreover, the results have affirmed the mediation role of job characteristics between agile PM and SDA practices as well as intention to stay.

Limitations and Suggestions

Regardless of valuable findings, the present study has several limitations that should be noted and worked out. First, all the variables taken as factors of intention to stay 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.

Second, 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 intention to stay. Third, hence this study has presented simple and direct relationships of agile practices with intention to stay, 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.

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