Hewlett Packard Enterprise

Technology & Processes Even More Important Than People in Driving Development Success

Research White Paper

Technology & processes even more important than people in driving development success

Executive summary

Ask ten IT people what the most important factors are in determining the success of development projects and you might get ten different answers. The people? The processes? The culture at the company? The technologies? The tools? The shoes? Even in more academic circles there is not agreement. In the research described here we look at the relationship between a number of project considerations and six measures of project success. Results show that participants rate the performance of various people and team considerations the highest, but correlational and regression analyses suggest technology and process considerations are even more important in explaining the success of development projects.

ABOUT THIS RESEARCH

We interviewed 403 Development and IT Professionals using a 15 minute online survey.

Profile of companies:

- 500+ employees in company
- All verticals except ISVs and Education

Participant's primary role in organization:

- Dev Team (n=100)
- IT Operations (n=103)
- Test (n=100)
- Project Mgmt/Enterprise Project Management Office (EPMO) (n=100)

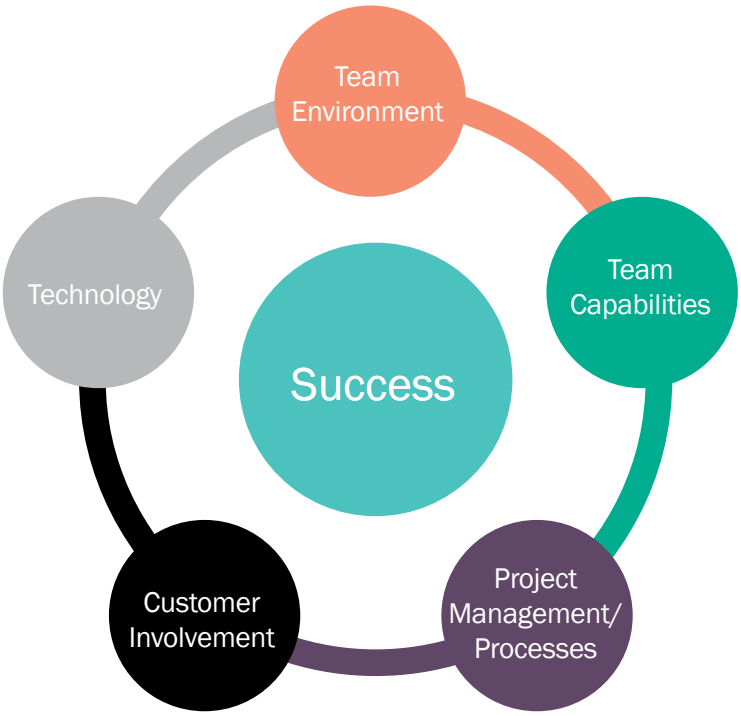
Key topic areas:

- Performance ratings for various aspects of the development ecosystem for a focal application worked on.
- Success metric ratings for six key areas for a focal application worked on.

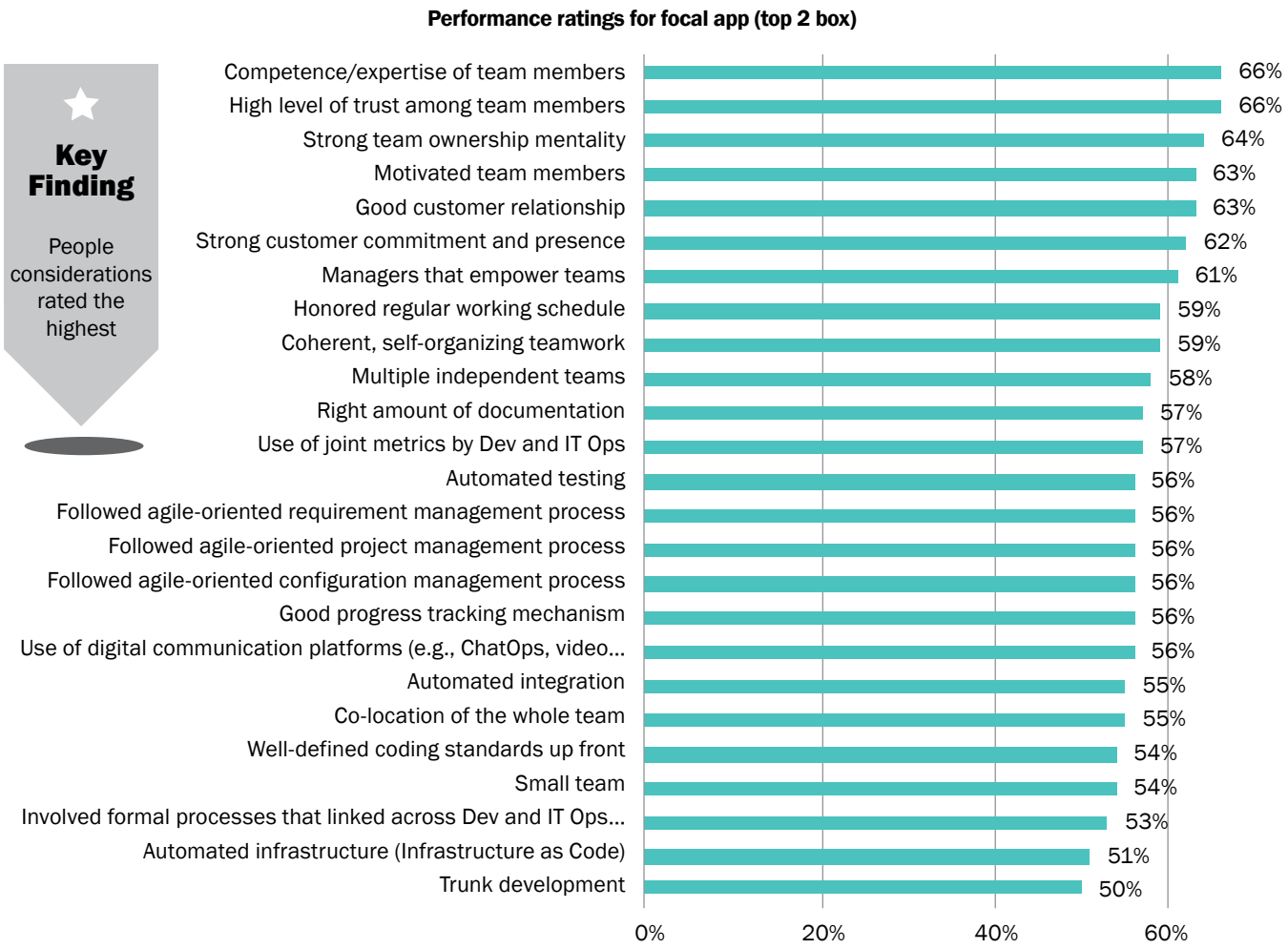
This research was sponsored by Hewlett Packard Enterprise and conducted by YouGov

Critical success factors for development projects

Academic and commercial researchers examining the critical success factors for development projects have come to some agreement on the range of considerations that play a role, such as characteristics of the organization, including the team structure, various aspects of the people involved, including the team and internal customer, the processes and methods used, and the types of technologies employed. On the people side it's straight out of a psychology text book, including distinguishing between whether the people trust each other, have a team mentality, are motivated, and if they are competent. We leaned on this work and our own expertise to come up with a list of 25 items intended to cover this spectrum of considerations. Participants were asked to rate their experience on these items for the *most important* development project they worked on in the past 12 months, among a list of applications such as web, mobile, desktop, cloud, business, database, etc. that they had said they worked on. The specific question was: *"For the*



same focal application, please rate the experience of working on that application on the following dimensions" (7pt scale; *Does not describe at all to Describes extremely well*). Below are the top-two box results (i.e., percentage who rated item a 6 or a 7) for those ratings. As can be seen, the top rated dimensions all relate to the *people* considerations, including competent team members, a high level of trust among team members, a strong team ownership mentality, motivated team members, etc. The top 10 are all people considerations, with those items focused on characteristics of the team members themselves, as opposed to more structural team considerations,



particularly high. The items appearing at the bottom of the list might make some IT executives cringe, such as *trunk development* and *automated infrastructure*, given many view those as indicative of operating at a higher level. But perhaps not surprising that they are difficult to achieve.

Predicting project success

The above numbers are just perceived performance. More interesting is how well those considerations predict some gauge of project success. Besides rating their focal application on the 25 items, we also had participants provide six ratings that cover a range of ways to measure the outcome for the project. The question was: *"For the focal application, please rate the degree to which the following goals were met"*; 7pt scale, *Fell Short of Goals* to *Exceeded Goals*.

Project outcome measures

- Quality & performance
- Time to market
- Speed of delivery
- Scope
- Security
- Cost/use of resources

The below graph depicts the correlations relating the performance ratings to the *average of the outcome metrics*. Two trends deserve comment. First, all of the items help explain the aggregate outcome measure to some degree, suggesting that all of considerations included in the research are indeed relevant to some degree. Second, the order of the items is very different than observed with the raw performance ratings, with many of the people considerations appearing more towards the bottom, and with some of the items that were at the bottom of the performance ratings rising to the top (e.g., *automated infrastructure, trunk development*). Four

Correlations of performance ratings with average of outcome metrics

Key finding

Reverse of performance ratings, with process & tech items rising to top

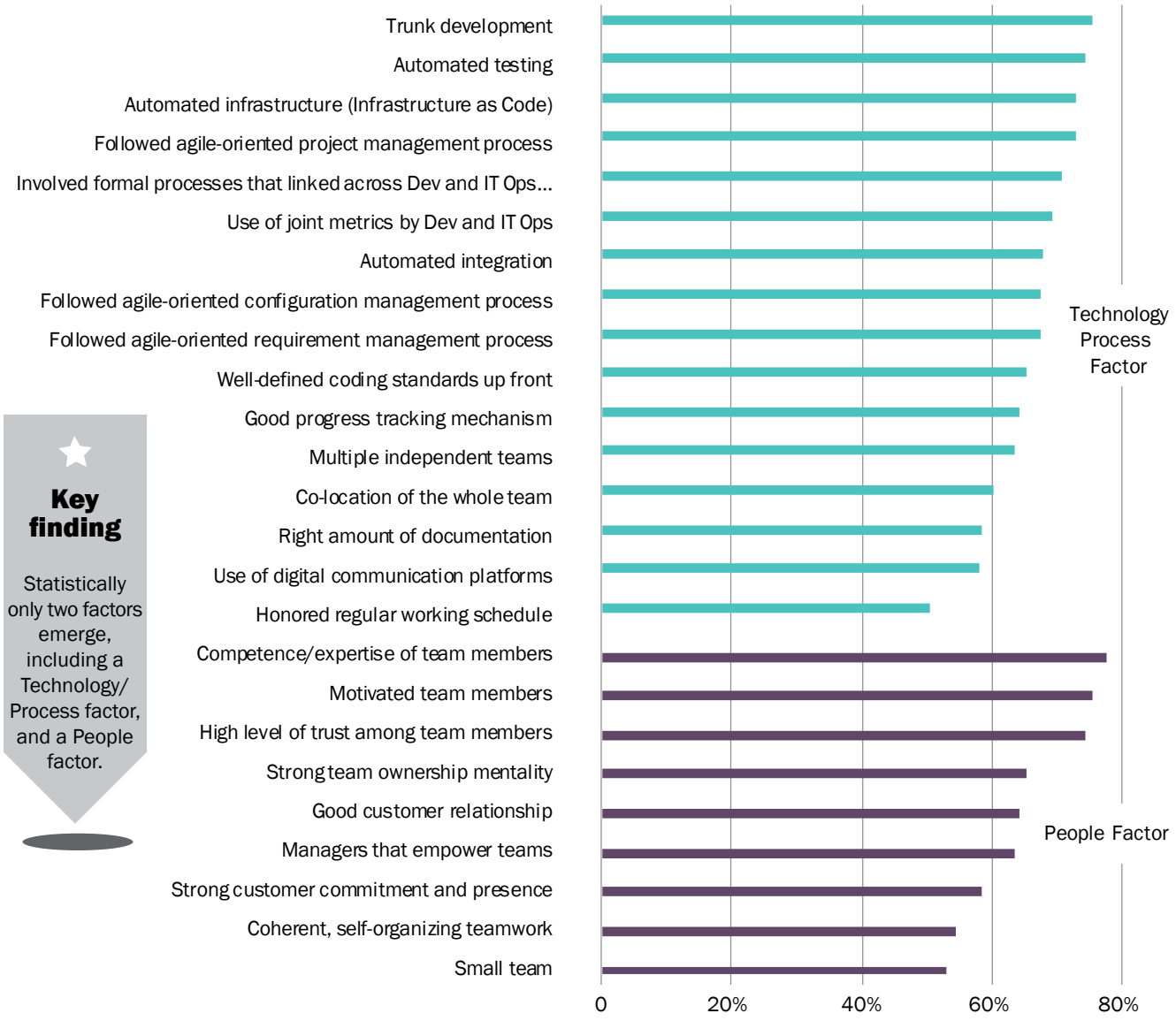
of the top items all relate to project management/process considerations, including *followed agile-oriented requirement management process, involved formal processes that linked across Dev and IT Ops domains, followed agile-oriented project management process,* and *followed agile-oriented configuration management process*. In summary, while participants give themselves high marks for people considerations, when you *derive the importance* of the various items to success through statistical analysis, it appears that many of the project management/process and technology considerations are most important.

Identifying and determining the impact of underlying dimensions

In order to impose some structure on the relatively long list of items, a factor analysis was run on the performance ratings, which is an exploratory statistical technique that reveals how the participants themselves slice up the space, based on the correlations of the items with each other. Below are the results of the factor analysis. Only two factors emerged, including what we dubbed the *Technology/Process* factor, and a *People* factor. Given the items

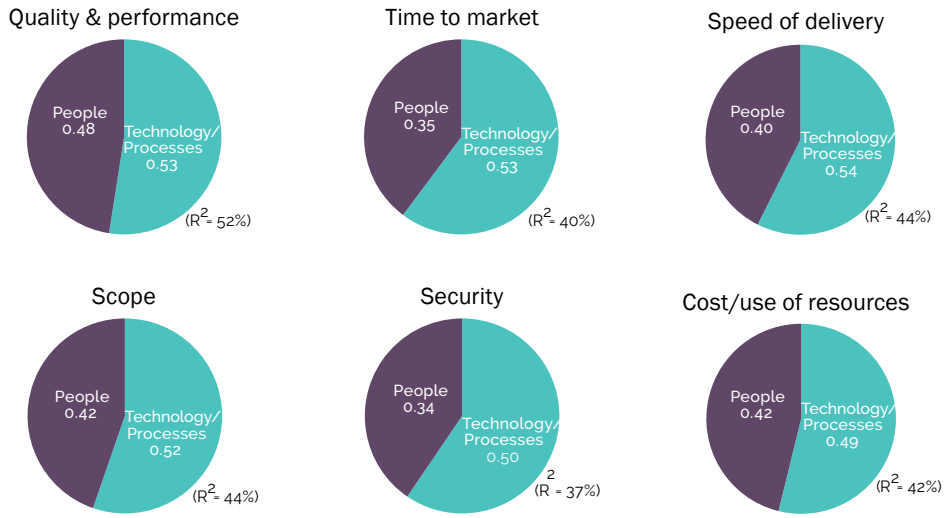
are sorted within each factor by their factor loading, items that appear at the top of the factor are more central to that factor than items that appear towards the bottom of the factor's items. So for example, for the first factor *trunk development* and *automated testing* are more central to that factor than *honored regular working schedule* or *use of digital communication platforms*. Similarly, the *competence*, *motivation*, and *trust* of team members is more important to the second factor than *small team* or *coherent, self-organizing teamwork*.

Factor analysis on performance ratings for focal app (factor loading)



So participants slice up this domain less granularly than we did in designing the research. But the factor analysis doesn't tell us anything about how important the underlying factors that were identified are to project success. The below analysis sheds some light on that, where we ran six distinct *regression* analyses using the Technology/Process and People factors as predictors of each of the six project outcome measures. For every metric both factors explain a reasonable amount of the variance, meaning they are both important considerations. Interestingly, for every metric the Technology/Process factor is a bit more important than the People factor in explaining success.

Predicting success metrics using factors as predictors (beta coefficients)



Key finding

Both the Technology/ Process factor and the People Factor are important drivers of success, with the Technology/Process factor a bit more importan across success metrics

Looking ahead

The results of the above factor analysis were a bit surprising to us, as we were expecting more granularity in the dimensions that emerged. However, the analysis was conducted across all of the participants in the study, which includes a relatively wide range of organizations in terms of development approaches and sophistication. Given this, a number of additional factor analyses were run on various segments of the data, and as was suspected, more complex solutions emerged for a number of them. The sample sizes were smaller for these analyses, and thus the results were a bit noisy, but we show a high level view of what we found for one segment – those with widespread DevOps implementations. As can be seen, five distinct factors emerged, suggesting those with widespread DevOps implementations have a more nuanced appreciation of the space. Regression analyses similar to those described earlier suggest most of the factors that emerged contribute to explaining project success. Future research should explore such segment-specific solutions further, including how well those factors predict project success, which can guide investments.

Collectively the lesson from these analyses is that organizations cannot focus on only technology and processes, or only people - both considerations are critical to successful development projects. But the *relative* ease with which technologies and processes can be changed makes that an attractive target for organizations looking to immediately move the needle.

Conclusion

While most experts see a wide gamut of critical success factors for DevOps, the market views it a bit simpler, seeing two broad classes of considerations – technologies/processes and people considerations, with the former a bit more important. Given it is easier to change the technology/processes factor, relative to the people, orgs should prioritize investment accordingly.

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