CASE STUDY

Radix: Delivers Results with CMMI® and Behavioral Driven Development in Agile Environment

THE BUSINESS NEED

Radix's ultimate goal is to be the benchmark partner that supports its clients' businesses and most critical technology issues across the several stages of operations. Radix combines the company's technological expertise with their client's efficiency needs through innovative solutions specified and implemented from knowledge of their clients' operations.

In order to achieve this goal, Radix embraced CMMI® best practices. In 2012 they were appraised at CMMI for Development (CMMI-DEV) Maturity Level 3. With this designation, Radix was able to expand their business by adding more clients and projects, while ultimately maintaining their development process and standardization techniques.

Recognizing the incredible results and successes of other organizations adopting High Maturity practices, Radix set their sight on achieving CMMI-DEV Maturity Level 5 for their own organization. During their 2015 reappraisal process Radix achieved their goal of reaching Maturity Level 5. Most importantly, however, they gained increased productivity control, less risk in planning, and greater visibility of the results achieved.

CMMI allows for continuous improvement on processes, and when it came time for Radix's next reappraisal, they looked to improve team communication and productivity. They also wanted to establish credibility in the U.S. market, which required the ability to demonstrate product quality and project performance.

COMPANY BACKGROUND

Radix is a Brazilian-owned engineering and software development company which offers technology services and solutions to meet the demands of the primary process industries in Brazil and the world.

Founded in April 2010, the company is rooted in the firm conviction that, with the enormous technical and human capital potential developed in universities and technology centers existing throughout the country, Brazil is an ideal center for technology development. Its name derives from Latin and means root or origin.

Radix received top honors in the CMMI® Institute Capability Challenge during the 2019 CMMI Capability Counts Conference.

The company had been using more traditional methodologies such as Functional Specification or Use Cases in order to perform Requirements Specification. In 2017, the Radix organization began utilizing agile practices as a catalyzer for process innovation. In 2018, they were reappraised in CMMI-DEV Maturity Level 5, presenting the use of Behavioral Driven Development (BDD) in their process as innovation.

THE SOLUTION

Radix used concepts from the Requirements Development in CMMI V1.3 to build and deploy a use-case template for describing software requirements. They used the information from the Verification and Validation process areas to implement test-case templates to execute test scenarios. From Quantitative Project Management, Radix was able to create process performance baselines.

In the previous baseline, the Radix process group noticed a high variance in the productivity of the sub-processes of Requirements Analysis and Testing. In order to reduce this variability, Radix selected an innovative improvement.

Radix decided to implement BDD, a software development approach that has evolved from TDD (Test Driven Development). BDD is a different way to write the functional documentation using a common language, which improves communication between requirements analysts, testers, developers and clients. By writing tests ahead of the code, the testing is more user-focused and based on the system's behavior.

Some advantages of using BDD:

- Requirements analysts and testers working together in writing scenarios
- Transfer of knowledge between teams creating a multidisciplinary team
- Same documentation for requirements and testing teams
- Focus on quality
- Focus on test automation
- It's a technology widely used in the software market

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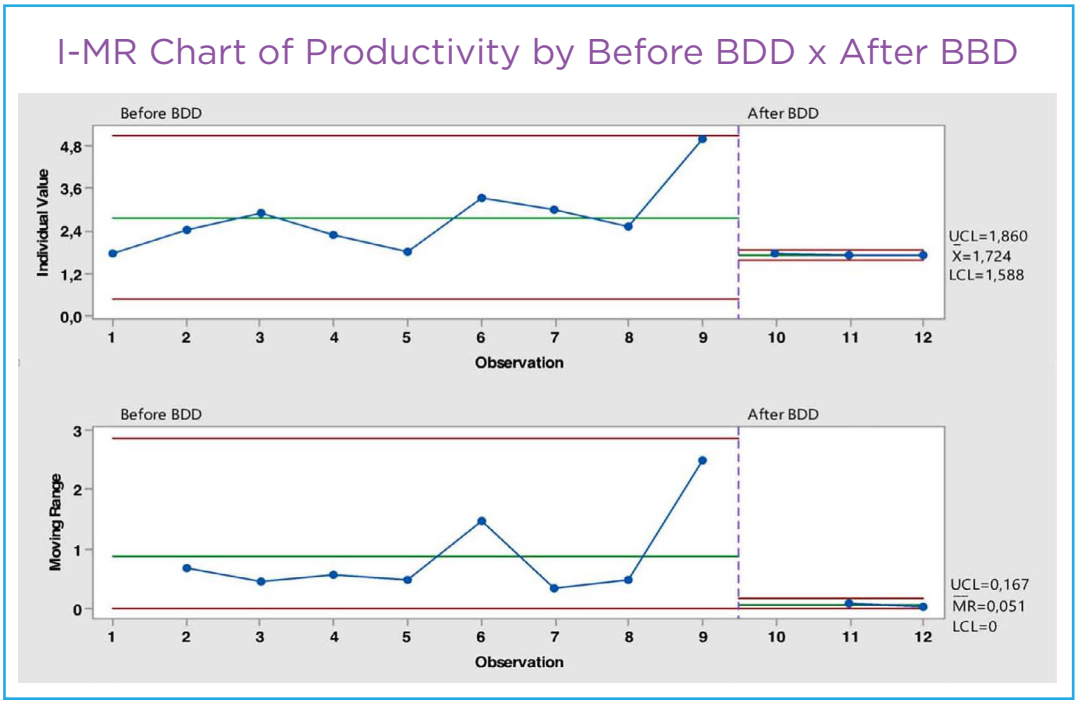
RESULTS

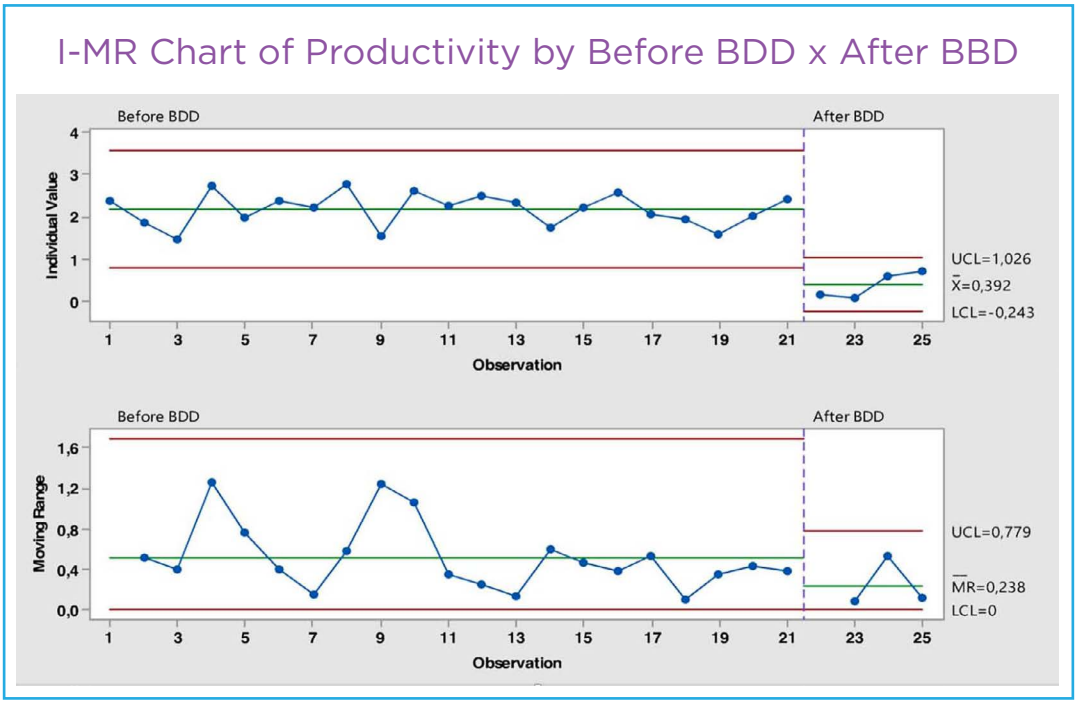
The use of BDD helped to reduce 37.8% of requirement analysis efforts, and 81.9% of testing efforts. The client was satisfied with both the documentation and the system. Additionally, 90% of total defects were identified by the testing process.

CMMI adoption was fundamental in obtaining credibility in the U.S. market, because it helped to convince customers of Radix's commitment to product quality and project performance.

"Our work and focus through the CMMI maturity approach have propelled measurable improvement across the organization," stated Manager of Process Improvements, Caroline Rivera. "Being recognized through this international challenge validates the effort of our leaders and employees worldwide and has been fundamental for Radix in the U.S. market, because it helped to convince customers of our commitment to product quality and project performance."



S1- Analysis Process (Requirements): Radix had an average reduction of 2.772 to 1.724, representing a 37.8% improvement. The upper limit fell from 5.090 to 1.860 and the lower limit increased from 0.457 to 1.588.



S4- Test Process: Radix had an average reduction of 2.173 to 0.392, representing an 81.9% improvement. The upper limit fell from 3.547 to 1.026 and the lower limit fell from 0.799 to 0.

KEY TAKEAWAYS

With BDD implementation, Radix achieved the following successful outcomes:

- Communication between requirements analysts, testers, developers and clients improved;
- Teams were motivated to work with one of the most modern technologies used in the market;
- Radix's processes are best applied in the Agile context.

With 81.9% reduction in manual tests, Radix will definitely continue to invest in test automation. The objective for our next improvement cycle is to increase the percentage of defects identified by the testing process.

By achieving CMMI Maturity Level 5 in 2015 and 2018, Radix obtained more visibility both in the national and international markets.

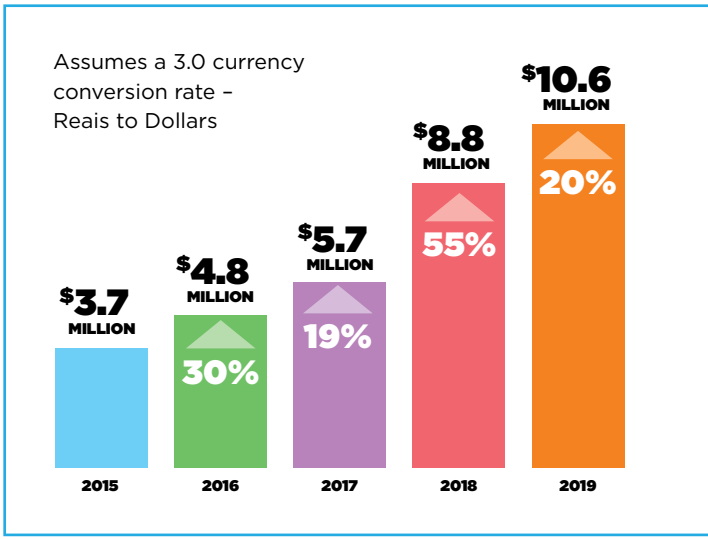
Although the cost of CMMI Maturity Level 5 appraisals is typically higher than Level 3, the total cost for implementing high Maturity Levels in Radix was 40% lower than the previous CMMI Maturity Level 3 initiative.

The positive return on high maturity investment was realized in less than two years by the increase in the number of clients and projects.

From 2015 to 2016 (after implementing high maturity process), Radix had a return on investment of 30% in forecast.

From 2017 to 2018 (after implementing Agile Methodologies in their CMMI process), Radix had a return of investment of 55%.

For 2019, Radix already has a planned growth in forecast of 20%.



For a closer look at Radix's performance journey, view their Capability Challenge video.
https://www.youtube.com/watch?v=ZiCw0v1K4a0

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A subsidiary of ISACA Enterprises, CMMI Institute (**cmmiinstitute.com**) is the global leader in the advancement of best practices in people, process, and technology. CMMI Institute enables organizations to elevate and benchmark performance across a range of critical business capabilities, including product development, service excellence, workforce management, data management, supplier management, and cybersecurity.

For over 25 years, thousands of high-performing organizations in a variety of industries, including aerospace, finance, healthcare, information technology, software, defense, transportation, and telecommunications, have achieved sustainable business success through CMMI adoption and demonstrated their ability as capable business partners and suppliers.