Topic: KneeBend Ltd, Recruiting and retaining the best staff by implementing Lean & Agile methodologies

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Abstract

Lean and Agile are well established methodologies in a variety of industries, including software development, due to their ability to improve efficiency and focus on delivering value to customers. Many organisations make the move to these models but can often struggle with resistance to change and moving away from established behaviours and procedures. As a result this can cause an imbalance and creates inefficiencies that bring unnecessary pressure and stress to the employees. This paper will examine the case of KneeBend Ltd., an IoT company struggling with hiring and retaining I.T. staff.

This paper proposes a solution to KneeBend Ltd.'s challenges by offering a framework to transition to Lean/Agile methodologies. The framework involves a phased approach that prioritises education and training to enable staff collaboration to make changes where they are needed. The end phase is a full adoption of the methodologies throughout the company with emphasis on a continuous cycle of improvement.

Keywords

Agile, Lean, staff retention, recruitment, DevOps

Chapter 1: Introduction

1.1 Background

KneeBend Ltd. develop and produce IoT software and services for exercise products in an increasingly competitive market. Currently, KneeBend Ltd. employ 70 personnel in its head office in Ireland, and a further 40 staff across sites in India, China and the USA. The company has 6 products which compete well in the European, Asian and North American markets.

1.2 Context

KneeBend Ltd. has seen a decrease in revenue by 10% over the last 2 quarters as a result, in part, of not meeting delivery deadlines and incurring penalties. While it is noted that staff are generally happy, the Production Department is struggling to recruit and retain staff. According to Bisht & Singh (2012) higher turnover in IT professionals can be related to workplace stress such as overwork and performance related pressures, which can have an impact on their personal lives and inevitably results in the employees seeking employment elsewhere if there is the possibility in reduced stress, *"thus when the professional stress invades the personal life and employees are not able to handle this any more; they start exploring other options and often switch to other jobs even if they have to compromise on their salary and benefits for a job where they could devote more time to their family."* Furthermore, Abbasi & Hollman (2000) states *"the loss of key employees may negatively impact the quality and innovation of services delivered. As a result, it may adversely affect the satisfaction of citizens/customers"*, which can be observed in the case of KneeBend Ltd. The company is missing deadlines, suffering financial penalties and falling behind on project work while planning on creating more products to keep up with competition and at the same time struggling to retain staff and hire staff with specialist skills.

In relation to recruitment, increasing staff pressure and missing deadlines could impact the reputation of KneeBend Ltd. as a potential employer. High staff turnover would indicate dissatisfaction within the Development Department and according to Edmans (2011) *"high satisfaction can be a valuable recruitment tool."*

1.3 Challenge

KneeBend Ltd. are having difficulties hiring high quality I.T. staff and are experiencing high employee turnover. When looking at the company structure and work environment several problems relating to how DevOps & Agile have been implemented within the company can be observed;

- Poorly implemented Agile methods (example: regular scheduled deployments rather than CI/CD)

- Outdated version control system

- Lack of cohesive collaboration tools

- No production telemetry

- No central repository

- Production logs are siloed and require requests to access

- Manual testing

KneeBend Ltd. believe they have implemented Agile principles, but the reality is that only some teams have implemented some aspects of Agile. In reality, the company continues to operate in a rigid, monolithic structure, *"A team going agile has to look honestly not just at the way they build software, but also at the way*

they interact with each other and the rest of their company." Stellman & Greene (2014). Teams do not interact with one another in an open manner, many parts of the development process are siloed like productions logs or the lack of a central repository. To make matters worse, the method of communication is inconsistent with the developers in China and the USA using Slack while the teams in Ireland and India use Jira. Much of the development, testing and QA processes are manual with no telemetry resulting in long development cycles and delays in handing off workloads to relevant teams or even obtaining logs.

1.4 Research methodology

This paper follows a literature review approach to investigate the relationship between an underperforming work environment and the effect it has on recruiting and retaining staff. The review involved searching and analysing relevant academic sources such as peer reviewed journals, conference proceedings, research papers and books. These sources are compiled from a combination of case studies, interviews and empirical studies.

1.5 Goals

The goal of this study is to analyse the implementation of DevOps methodologies within the company. This analysis will present several solutions offered to remedy poor staff retention and low appeal to potential recruits. The results of this study would be of interest to management and shareholders within KneeBend Ltd. as there is also opportunities to increase productivity, reduce costs and encourage innovation.

Chapter 2: Strategy

2.1 Strategy Creation

Using the business model canvas it can be identified who needs to be involved, a high level view of the tasks involved, costing and the expected return for undertaking this task. In this case, staff from the production team, management and HR are key in successfully implementing an Agile/DevOps methodology with the expected end result to be improved employee morale, a reduction in staff turnover and an improvement in recruitment success. An improved working environment paired with employee incentives should reduce loss of staff and increase standing against competitors in the recruitment market. Human Resource Management International Digest analysed 15,000 glassdoor reviews of employees in the I.T. sector in their article *Can't get no satisfaction: exploring job (dis)satisfaction in Silicon Valley through Glassdoor reviews* (2022) and found 5 key areas related to job dissatisfaction;

- role ambiguity and conflict

- supervisor behaviour

- job design

- compensation

Business Model Canvas			Designed for: KneeBend Ltd.	Designed by: Craig Dillon	Date: 12/02/2023	Version: 1
Key Partners Staff Management HR Training providers	**Key Activities** Review Agile implementation Assess improvements in tooling Training and development Empower staff by implementing DevOps methodologies **Key Resources** HR and management Training budget IT budget	**Value Propositions** Improved efficiency Ability to meet customer demands and deadlines Reduced pressure on staff Improved customer relations Headroom to support new features and products Improve company reputation for potential hires		**Customer Relationships** Regular employee training opportunities Regular employee feedback **Channels** Employee referral program Regular employee feedback questionaires		**Customer Segments** Current staff Potential recruits
Cost Structure Employee training budget IT budget for improving or implementing new tooling Recruitment budget			**Revenue Streams** Reduced staff turnover Improvement in successful recruitment Increased productivity and efficiency Improved employee morale			

Figure 1: Business Model Canvas (Source: Osterwalder (n.d.))

- training and development

Compensation was ranked least important of the 5 points for employees in the I.T. sector while working conditions and opportunities to learn were ranked 1st and 3rd respectively. This information can help form a strategy for KneeBend Ltd. where a combination of training, improving working conditions and employee referral incentives can improve their staffing problems.

2.2 Strategic Analysis

Strengths	Weaknesses
Established company	10% decrease in revenue over the last 2 quarters
Mature products	Missing deadlines
Competitive product design & price	Struggling to hire staff
Existing customer base	Losing staff
Some staff already trained in Scrum	QA & Testing teams lack Scrum training
	Poorly implemented Agile methodology
	Siloed teams and data
Opportunities	**Threats**
Improved delivery times	Competitors are innovating
Ability to add features in a timely fashion	New competitors are entering the market
Capacity to develop and support new products	OEMs may refuse updates
Deliver value to customers	Reputational damage
Successful Agile implementation is attractive to candidates	Competitors have offerings in more markets
Empowered, productive teams	Competitors have higher net incomes

Table 1: SWOT analysis of KneeBend Ltd.

SWOT (Strengths, Weaknesses, Opportunities, and Threats) analysis shows that KneeBend Ltd. would benefit from implementing Agile beyond Scrum training for programmers. It would bring benefits in improving the working environment, which in turn would bring improvements in development and delivery times finally resulting in improving their competitive edge both in recruitment and in their product market.

There are some clear weaknesses that need to be addressed in order to reach this point, for example, there is a disparity in the training already received with some programmers without Scrum training and the QA and Testing teams have received no Scrum training at all. There are also weaknesses around the working environment, for example, using outdated software and tooling combined with certain tasks being siloed to individual teams.

2.3 Strategy Alignment

Project	Rating[1-10]	Weighting[1,3,5]	Final Score
New Version Control System	8	5	40
Centralised Repository	8	5	40
Access to Production Logs	5	3	15
Production Telemetry	5	3	15
Automated Testing	7	5	35
CI/CD implementation	8	5	40
Agile/Lean Training	10	5	50

Table 2: Balanced scorecard measuring importance of tasks to be carried out

There are several key areas that require improvement and while suggestions could be made for implementing new tooling and providing easier access to siloed information this still does not tackle the core issue for employees in KneeBend Ltd. which is a lack of cohesion and a poorly implemented Agile methodology. Training carries the greatest weight as it can empower the staff to make decisions and solve the highlighted issues in a way that best suits their needs.

2.4 Proposed solution

The proposed solution is extensive training for all staff in Agile and Lean methodologies. KneeBend Ltd. has not implemented Agile in a meaningful way which is beginning to have a negative impact on their performance. For Agile to be effective the entire company adopt must adopt and implement the principals of Agile, this requires management to provide coaching and support rather than direction to the technical teams. Solving issues surrounding tooling or communication between teams rather than implementing Agile in a meaningful way would be arbitrary and would most likely result in exasperating the problems. By providing comprehensive training and consultation to the whole company it can empower at all levels to adopt Agile in a way that suits their needs. Teams should be self organising and barriers of communication and collaboration removed, the current monolithic structure is hindering development. The result of a successful implementation of Agile would see an improved work environment, success in product delivery, a reduction in staff turnover and the company becoming more attractive to potential employees.

Chapter 3: Solution

3.1 Technology Assessment

While the proposed solution focuses on training staff to facilitate empowerment, which will improve the working environment, it is worth highlighting some short-comings in tooling and technology with possible solutions.

- Outdated version control and no central repository - move to a modern solution like Git or Jenkins for example

- Lack of cohesive collaboration tools - choose one tool for communication and collaboration

- No production telemetry - there are many open-source and enterprise solutions for telemetry from customer deployments

- Siloed logs - a centralised logging service allows teams to troubleshoot as they need, again there are several enterprise and open-source solutions for this

The final decision on what solutions fit best should come down to the relevant teams, these are areas that need attention and KneeBend Ltd. would be in a much better position to make these changes when the staff have a better understanding of what is required to achieve their goals in a Lean/Agile environment.

3.2 Solution critique

The proposed solution does come with some caveats. For example, KneeBend Ltd. are already falling behind and failing to meet deadlines which is having a negative impact on their reputation. Training and implementing new methodologies takes time and rectifying internal issues to create efficiencies extends the time required to follow through with the proposed solution. Shifting a company to Agile is risky and KneeBend Ltd. are already on the back foot in terms of market performance, *"However, empirical studies have shown that agile adoption unfolds in many different, unanticipated, and often ineffective ways, creating risks and challenges that are still poorly understood"* Ciriello et al. (2022) Deciding to make such a comprehensive cultural change within an organisation will inevitably bring resistance which could result in the company going back to how it currently operates after any training or consultation. Kotter & Schlesinger (1979) suggests five methods for dealing with change resistance which could be useful in moving towards the goal; education, participation, facilitation, negotiation and coercion.

3.3 Governance

The purpose of the proposed solution is to provide the teams and staff the necessary skillsets and knowledge to make decisions on how to solve issues around tooling and workflows. To further enable this, adopting Lean as a means of governance would be complimentary as the teams can combine the principles of Agile and Lean, which ultimately results in an efficient oraganisation supported and

motivated from the top down that can respond quickly to market and customer demands. Both Lean and Agile share a focus on delivering value, continuous improvement and efficiency. Ambler (2009) supports this, *"Our experience was that these lean principles provided the insight required for effective governance of agile project teams,"* and *"The heart of the Lean Development Governance framework is that good governance should motivate, and then enable, IT professionals"*

Lean principles	Agile principles
Value	Customer Satisfaction
Value stream	Accept changing requirements
Flow	Continuous and frequent product delivery
Pull	Dynamically pull stories from customer
Perfection	Attention to detail, regular feedback and continuous development

Table 3: Complimentary Lean and Agile principles

Lean governance allows management to support and enable the staff by removing some decision making from executives and management and distributing decisions around the organisation, this has the impact of having leadership to guide rather than dictate, *"leaders articulate the strategy and objectives in ways that their people can understand and support. The final step aligns individual goals to the strategy and vision, with the result that people fully understand their role in the organization and why it matters"* Jacquemont (2014). Enabling staff has been shown to be more successful than coercion as it helps employees perform more effectively and reinforces their commitment, Adler & Borys (1996).

3.4 Business Value

Several case studies have shown that a successfully implemented Lean/Agile methodology can improve the productivity, delivery rates, customer satisfaction, quality of work, staff engagement and even team morale. Weichbroth (2022) *"ten measures were successfully implemented: budget vs. actual cost, customer retention customer and user satisfaction, defects into production, defects over time, iteration burndown, planned vs. actual release dates, team morale, test pass/fail over time, and velocity."*, Papadopoulos (2015) *"The results of the case study revealed that adopting the agile framework on large, distributed projects improves quality, allows for requirement changes and additions throughout the project and improves the employee satisfaction while building the end product."* and Gustavsson et al. (2022) *"There are changes in the organization that employees are more actively involved in now."*.

There are a number of key value points available to KneeBend Ltd. by implementing Agile/Lean. While the goal is to reduce staff turnover and improve success in recruitment the other benefits are;

- improved customer value and company reputation

- reduction of waste in production

- an engaged delivery and feedback loop with customers

- a culture of enablement, improvement and development

- ability to quickly adapt to change

- commitment from staff towards overall company vision and goals
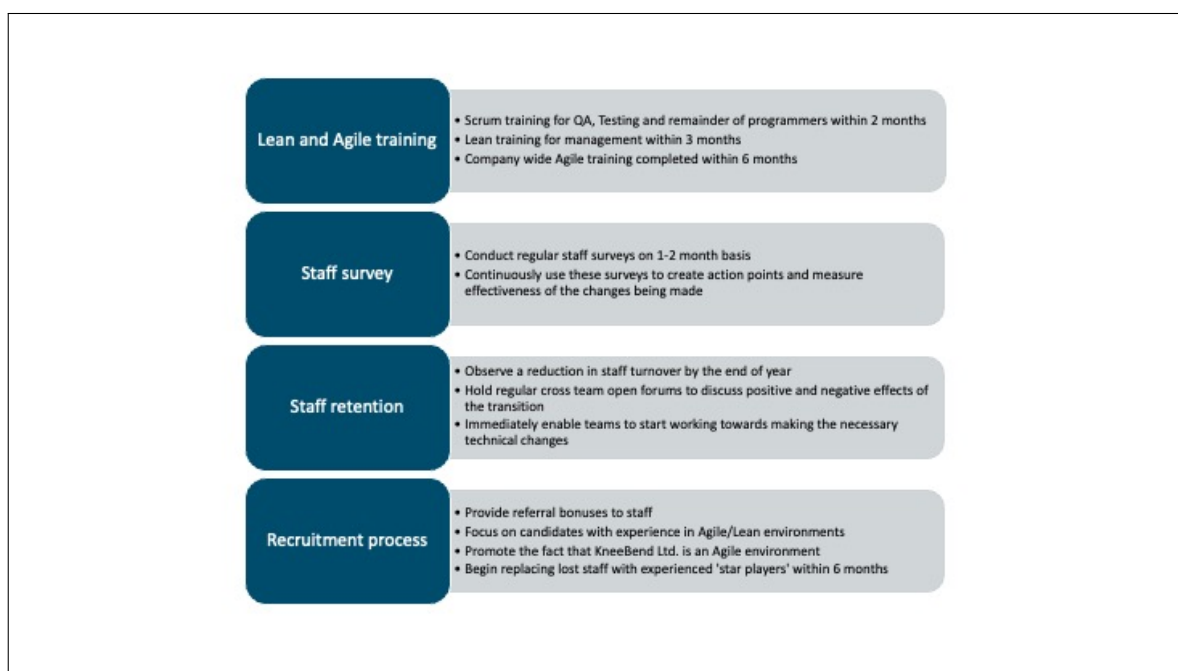
3.5 Performance Metrics

Figure 2: OKR for measuring success in retaining and recruiting staff (Source: self)

Staff retention can be measured by observing a reduction in staff leaving the company over a longer period of time in comparison to periods of time, where higher than average turnover was experienced. This can be used as a means of measuring the success of moving to Lean/Agile as the expected result would be a reduction in staff leaving. Using a calulation from Gandy et al. (2018), turnover can be measured by using;

- *S* - number of staff at start of period

- *L* - number of staff lost/leaving during period

- *N* - number of new staff starting during period

- *F* - number of staff at finish of period

The turnover rate relating to lost staff is calculated as follows:

$$\text{Lost Staff as Percentage of Average Numbers} = (2L \times 100)(S+F): (1)$$

The corresponding turnover rate for recruited staff is:

$$\text{New Staff as Percentage of Average Numbers} = (2N \times 100)/(S+F) \quad (2)$$

Therefore; the net turnover rate calculation is: $(2 \times (N-L) \times 100)/(S+F)$ (3)

Lean and Agile training can be measured by completion of relevant training, company-wide Agile training should be catered to the needs of each department. The principle is that the entire company can adopt Agile/Lean both as a methodology but also as a culture, HR for example would implement Agile as a framework to respond quickly to changes within the company, provide learning and training on an ongoing basis or to adjust the recruitment procedures. These goals are different compared to those of developers, but there must be an understanding of Agile principals and rationale across the company to harbour a functioning culture.

Staff surveys should be conducted regularly, as they will be key in measuring progress of the transition, staff morale and offer feedback in relation to areas that need improvement or attention. When discussing General Electric's transition to a company that encourages a bottom up approach, Beer & Nohria (2000) noted that Jack Welch (CEO of GE at the time) believed the company had to become *"boundaryless"* and that *"Feedback and open communication eventually eroded the hierarchy."* showing that regular feedback from the employees is a key part of facilitating change within an organisation.

Recruitment success has to be carefully measured, not only must the candidate be hired and retained they also must bring skills and quality that will drive the team and company forward. The recruitment process comes at a financial and *"The cost of selecting the wrong person will be very high and will have a negative impact on the productivity of the organisation"* Gopalakrishnan et al. (2009)
Melo et al. (2011) Lists nine metrics for measuring productivity of a worker in an Agile framework;

- Quantity

- Costs

- Timeliness

- Autonomy

- Efficiency

- Quality

- Effectiveness
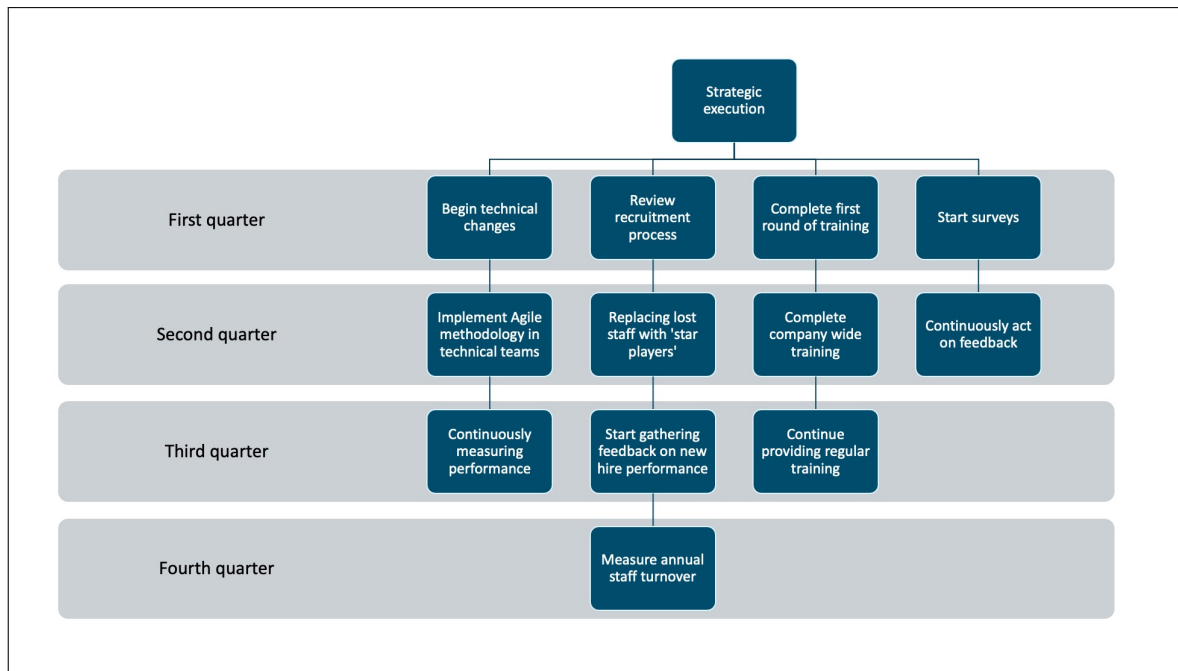
- Project success

- Customer satisfaction

Figure 3: User story outlining the Strategic Execution of the proposed solution (Source: self)

3.6 Strategic Execution

Implementing the suggested changes will take time, however, there are a few objectives that can be actioned immediately. Staff should begin discussing the technological shortcomings within the company and plan to implement consistent, agreed solutions across all sites.

By the end of the first quarter KneeBend Ltd. will have completed Scrum training for QA, Testing and any programmers who require it, while management will have completed Lean training. HR will have begun reviewing the recruitment process, focusing on hiring staff with relevant technical knowledge and experience within Agile frameworks and staff surveys will have started (using Officevibe for example).

By the end of the second quarter the technical teams should be self organising and silos no longer in place, data and communication should be moving freely. Modern technical solutions for the shortfalls noted in section 3.1 need to be in place and in use. HR will have begun hiring high quality staff to replace those who have left the company. Anyone in the company who has not already received Agile/Lean training will have completed by the beginning of the third quarter. Management and teams will be acting on feedback received from surveys.

The third quarter brings in continuous measurement, with the technical teams measuring the effectiveness of implementing Agile through metrics such as quality, timeliness, customer satisfaction and efficiency. HR will have begun to measure the performance of new hires, review any potential shortcomings and make changes to the process where needed.

By year end, HR will be measuring staff turnover over the year and will continue to do so going forward, training and education will continuously be offered and a commitment to continuous improvement.

Figure 4: Continuous cycle of the proposed solution (Source: self)

Chapter 4: Conclusion

KneeBend Ltd. are experiencing a high rate of staff turnover and are struggling to hire staff with the required skills. Evidence highlights that a work environment that is struggling to find success experiences higher turnover increasing pressure on the remaining staff who will then be at a much higher risk of leaving. KneeBend Ltd. are seeing this in effect by missing deadlines and losing staff, which will create knowledge gaps further exasperating the problem and ultimately reducing the quality of their products which can be observed with buggy releases that are also behind schedule. If employees are unhappy then candidates are likely to become aware of this, either through word of mouth, review sites like Glassdoor or even publications reflecting the company performance of late, which would be unfavourable when trying to attract the highest quality candidates available.

The problem is obvious, KneeBend Ltd. does not have a consistent Agile framework. There are technical shortcomings which could be addressed directly, but this won't remedy the underlying issues. Rather than force change on employees, encouraging a cultural change and enabling them to make decisions that improves both their own working environment and productivity has been shown to be extremely successful. Lean and Agile are frameworks that are designed for this approach and have been shown to be extremely effective for software development cycles, but also as an overall approach for an organisation.

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