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REFLECTIVE PRACTICE

Reducing employees' turnover in transactional services: a Lean Six Sigma case study

Alessandro Laureani

Hertz Europe Service Centre, Swords Business Park, Dublin, Ireland, and

Jiju Antony

*Department of Design, Manufacture and Engineering Management,
University of Strathclyde, Glasgow, UK*

Abstract

Purpose – The case study aims to illustrate the application of Lean Six Sigma into the human resource (HR) function of a service industry corporation.

Design/methodology/approach – The study draws on process information and primary data from a real project.

Findings – The study describes improvements in the HR management attributable to Lean Six Sigma: decrease of employees' voluntary turnover and increase in employees' satisfaction.

Originality/value – Although being extremely successful in the last two decades in the manufacturing sector, the application of Lean Six Sigma to the service industry in general, and HR management in particular, has been a controversial topic: this study illustrates how its application can reduce employees' voluntary turnover rate and increase their satisfaction, hence increasing the return on investment of human capital.

Keywords Six Sigma, Lean production, Human resource management, Employees turnover, Service industries

Paper type Case study

Introduction

The objective of this paper is to demonstrate the power of Lean Six Sigma in the human resource (HR) area of a business and remove the myth that Lean Six Sigma is only applicable to manufacturing operations: can Lean Six Sigma improve the HR activities of a company? What are the key opportunities and obstacles to its use in such activities? A case study, detailing the application of such methodology to a HR department, will also be analysed through this paper.

Literary review on Lean Six Sigma in HR

Lean Six Sigma is a business improvement methodology that aims to maximise shareholders' value by improving quality, speed, customer satisfaction and costs: it achieves this through merging tools and principles from both Lean and Six Sigma.

Lean and Six Sigma have followed independent paths since the 1980s, when the terms were first hard coded and defined: Lean originated in Japan (within the Toyota Production System), and Six Sigma from the USA (within the Motorola Research Centre):



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- Lean is a process improvement methodology used to deliver products and services better, faster and at a lower cost. Womack and Jones (1996) defined it as:
[. . .] a way to specify value, line up value-creating actions in the best sequence, conduct those activities without interruption whenever someone requests them, and perform them more and more effectively. In short, lean thinking is lean because it provides a way to do more and more with less and less – less human effort, less human equipment, less time, and less space – while coming closer and closer to providing customers with exactly what they want.
 - Six Sigma is a data driven process improvement methodology used to achieve stable and predictable process results, reducing process variation and defects: Snee (1999) defined it as “a business strategy that seeks to identify and eliminate causes of errors or defects or failures in business processes by focusing on outputs that are critical to customers”.

While Lean is all about speed and efficiency, Six Sigma concerns precision and accuracy: Lean ensures resources are working on the right activities while Six Sigma ensures things are done right the first time.

Lean Six Sigma uses tools from both toolboxes, in order to get the better of the two methodologies, increasing speed while also increasing accuracy.

Benefits of Lean Six Sigma in the industrial world (both manufacturing and service) include:

- ensuring services/products conform to what the customer needs (voice of the customer (VOC));
- removing non-value adding activities (waste);
- reducing the incidence of defective products/transactions;
- shortening cycle time; and
- delivering the correct product/service at the right time in the right place.

Although being extremely successful in manufacturing in the last two decades, the application of Lean Six Sigma in the service industry has been less spread, amid fears that the processes in the service industry do not lend themselves to the rigorous set of statistical tools of Six Sigma.

Even more in doubt is the application of Lean Six Sigma into HR practices, where the focus is on managing the human capital of the organisation, something which is notoriously difficult to pin down with strict metrics.

When Motorola originally implemented Six Sigma in the late 1980s, obtaining astonishing results, the company was then faced with the dilemma of how to reward its employees for those successes (Gupta, 2005): this was the first time Six Sigma and HR practices came into contact, and a more accurate definition of HR practices was needed.

If in the past the term HR was related only to administrative functions (e.g. payroll, timekeeping, etc.), the term has increased substantially in the last few decades to include the acquisition and application of skills and strategies to maximise the return on investment from an organisation's human capital (Milmore *et al.*, 2007).

HR management is the strategic approach to the management of all people that contribute to the achievement of the objectives of the business (Armstrong, 2006): as such it includes, but it is not limited to, personnel administration. In effect, it includes

all steps where an employee and an organisation come into contact, with the potential of adding value to the organisation (Ulrich, 1996).

As such, and merging terminology from Lean and HR, we define the following seven points as the human capital value stream map:

- (1) attraction;
- (2) selection;
- (3) orientation (or induction);
- (4) reward;
- (5) development;
- (6) management; and
- (7) separation.

The human capital value stream map is a Lean technique that identifies the flow of information or material required in delivering a product or service to a customer (Womack and Jones, 1996); human capital is the accumulated skills and experience of the human force in an organisation (Becker, 1993).

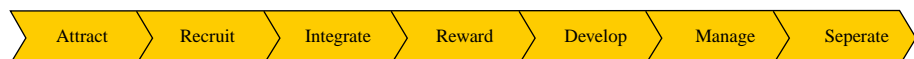
The human capital value stream map (Figure 1) is the flow of human capital required for an organisation to deliver its products or service to customers, the objectives of which are briefly described below:

- *Attract*. To establish a proper employer's brand that attracts the right calibre of individual.
- *Select*. To select the best possible candidate for the job.
- *Orient*. To ensure new employees are properly trained and integrated in the organisation.
- *Reward*. To ensure compensation packages are appropriate and in line with the market.
- *Develop*. To individuate talent and ensure career progression.
- *Manage*. To supervise and administer the day-to-day job.
- *Separation*. To track reasons for voluntary leavers and to maintain a constructive relationship.

It is possible to apply Lean Six Sigma tools to each step of the human capital value stream map, in order to eliminate waste in the HR processes (Wyper and Harrison, 2000). For each step in the human capital value stream map it is necessary to establish proper quantitative metrics that allow objective assessment and control of the process step (Sullivan, 2003): this makes use of the more quantitative statistical tools from the Six Sigma toolbox possible.

Establishing HR metrics can be controversial, with different parts of the organisation having different objectives (Jamrog and Overholt, 2005), but the answer to these simple questions may help to focus the real value each step can provide:

Figure 1.
Human capital value
stream map



- What is the expected deliverable of the step?
- What are the relevant metrics and key performance indicators of the step?
- What are the opportunities for defects in the step?

For recruitment, for example, the answers to the above questions may be as follows:

- Hire, in the shortest possible time, new members of staff to fulfil a certain job.
- The number of days to fill a vacancy (also define the acceptable norm for the organisation).
- Any job remaining vacant for longer than the acceptable norm.

Similar thought process can be performed for the other steps: having set metrics for each step of the human capital value stream map, an organisation is now in the position to apply Six Sigma define, measure, analyze, improve and control (DMAIC) to it.

We now review an example of DMAIC methodology application into the realm of HR.

A case study

The case focuses on a Six Sigma project conducted in the HR function of a large multinational company in the service sector: the objective of the project was to reduce employees' voluntary turnover.

The company was experiencing a very high voluntary turnover among its employees, with highs of 40 per cent in specific regions and/or functions. Although a certain level of employees' turnover was considered positive, as it allowed the company to right size its business based on the seasonality, its current level was considered by senior management as excessive and harmful to the business.

The recruitment and training costs of a new member of staff were \$5,000, and in the previous year the company had to hire 5,500 new members of staff, for a total cost of \$27.5 million. This number did not include the productivity lost during the learning curve of a new member of staff, but just took into account the expenses for recruiting and training them.

As such, this project was selected as a high priority and given the right amount of resources, both in terms of support and commitment from senior management and in terms of budget.

Sponsor of the project was the vice president for global talent management, who assembled a project team led from a Six Sigma Black Belt, and with members from various departments within the HR organisation (recruiting, training, compensation and career development).

Problem statement

The company was experiencing a high level of voluntary turnover among employees across its shops' network, with a peak of 40 per cent in some geographic areas and an average of 35 per cent, and a cost of tens of million dollars every year. The objective assigned to the project, from the sponsor, was to reduce turnover to an overall average of 25 per cent across the organisation.

Define phase

In the define phase, the project team, lead by a Black Belt, went through each of the value stream map's phases mentioned previously, to identify its own relevant stakeholders

and critical to quality characteristic. Extensive research was also conducted to collect the VOC: former employees in the previous two years were surveyed about the reasons why they left the organisation. A questionnaire was designed to understand the reasons why they left the company, ranking from one (weak reason) to five (very strong reason) various possible reasons (Appendix 1).

A project charter was completed and agreed from relevant stakeholders (Appendix 2); process maps for each step in the HR value stream map were also prepared. The map for the orientation step of new employees is shown in Figure 2.

Measure phase

During the measure phase, the team defined the key metrics of the project and delved into the data, to determine the size of the opportunity and calculate the defects of the process (Gates, 2007).

Some of the metrics identified were:

- cost per hire;
- time to fill a position;
- training/orientation expenses per hire;
- use of performance management programme; and
- use of exit interviews.

Data from the population of employees who voluntarily left the organisation in past years showed a disproportion of those with less than six months' service.

With the vast majority of leavers (61.3 per cent) in the first six-12 months of employment, it appeared that the recruitment and orientation steps were instrumental in determining whether the employee was going to stay a long time with the company (Figure 3): lack of training and orientation was mentioned as one of the most important factors in the questionnaire answers from ex-employees, together with career progression (Marden, 2008).

In terms of defect, the teams decided to consider a defect of the HR process as any employee who voluntarily left the organisation: as such the defects per million opportunities (DPMO) calculation was as outlined in Table I.

Analyse phase

In the analyse phase, the project team reviewed the data collected in the questionnaire and sliced them across different dimensions, using a Paynter chart (Figure 4), to highlight the most common reasons why employees left the organisation.

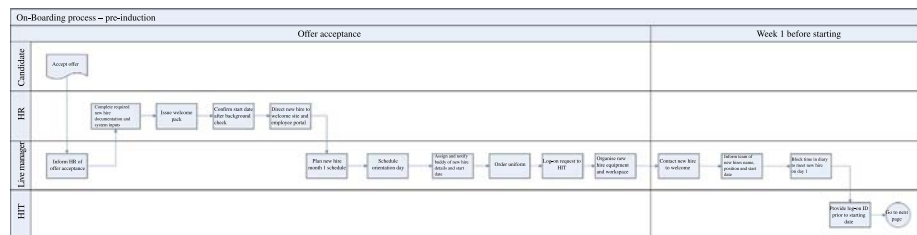


Figure 2.
Value stream map of orientation process

From the survey's data, the four most common reasons for leaving were as follows:

- (1) lack of career growth opportunities (i.e. no opportunity of career advancement in current role);
- (2) work schedule expectations (i.e. problems with the work shifts pattern required);
- (3) work duties (i.e. problems with the duties requested to be carried out); and
- (4) compensation (i.e. unsatisfied with the salary level).

While compensation was an important reason for leaving at the beginning of the employment, its importance decreased, but subsequently increased significantly again

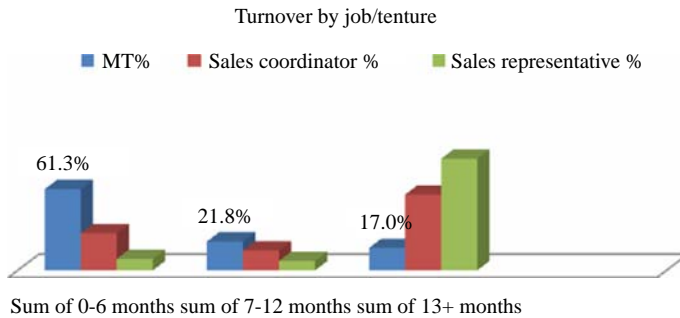


Figure 3. Employees' turnover by job type and length of tenure

Total employees	2,598
Voluntary leavers	899
Employees' turnover%	35
DPMO	350,000

Table I. Process defects before the project

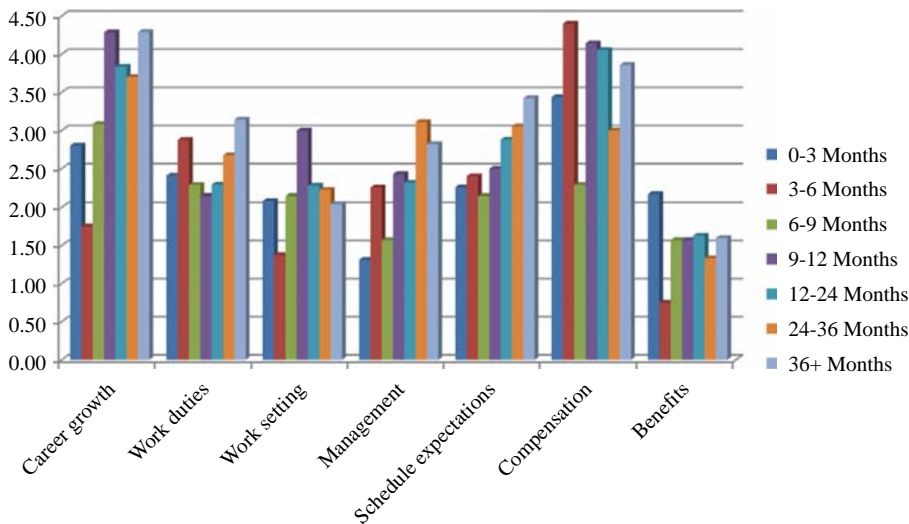


Figure 4. Paynter chart of job tenure vs reasons for leaving

at the first year anniversary of employment (following the performance review cycle; Figure 5). After a while, employees were more concerned with the lack (or perceived lack) of career opportunities than anything else.

Improve phase

The project team considered that lowering the turnover rate was necessary to increase job satisfaction, acting on the factors that were highlighted as the most important from the data's analysis (Mobley *et al.*, 1979). As the vast majority of employee turnover took place in the first six-12 months of service, it was decided to focus improvement actions on the recruitment and orientation steps of the human capital value stream map, as those were the steps directly affecting new recruits.

Ideas for improvement were generated in quality improvement workshops "Kaizens" conducted across different regions, with representatives from the local HR department, and led from the Black Belt in charge of the project.

The team opted for the following improvements action to be piloted:

- The recruitment process was reviewed, with less reliance on recruitment agencies and more use of direct recruitment and a so-called "Refer-A-Friend" programme: these are initiatives where existing employees are rewarded for referring a person to the company. The underlying idea was to recruit people that best fit the organisation, therefore trying to reduce the high first-year turnover: people referred from an existing employee were more likely to be familiar with the company's structure, culture and expectations as the employee would have talked about them. To incentivise the programme, a bonus scheme was put in place: once a person was hired, being referred from an employee, that employee would receive a \$500 bonus, and if the new recruit stayed more than six months, another \$500 bonus would be paid to the employee that referred him or her.
- An extensive review of the training and orientation for new hires took place, covering the time from the new hire accepting the offer to the end of the induction period. A standard, global orientation day was designed, to ensure each new employee was exposed to the mission, vision and values of the organisation (Figure 6).

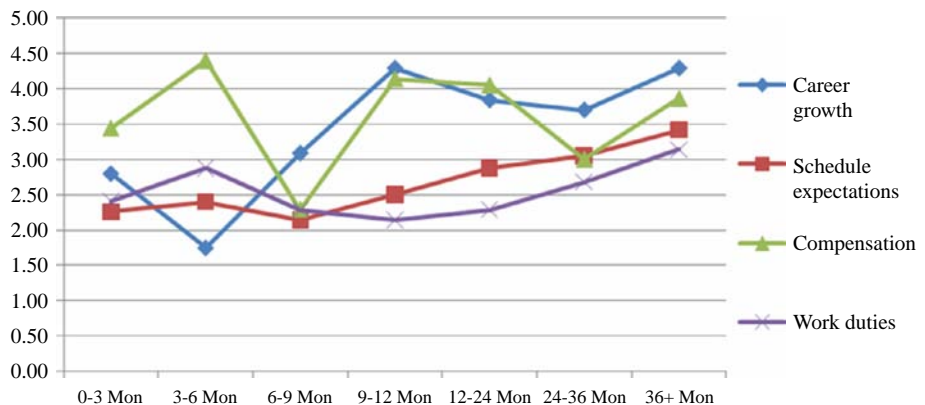


Figure 5.
Top reasons for leaving

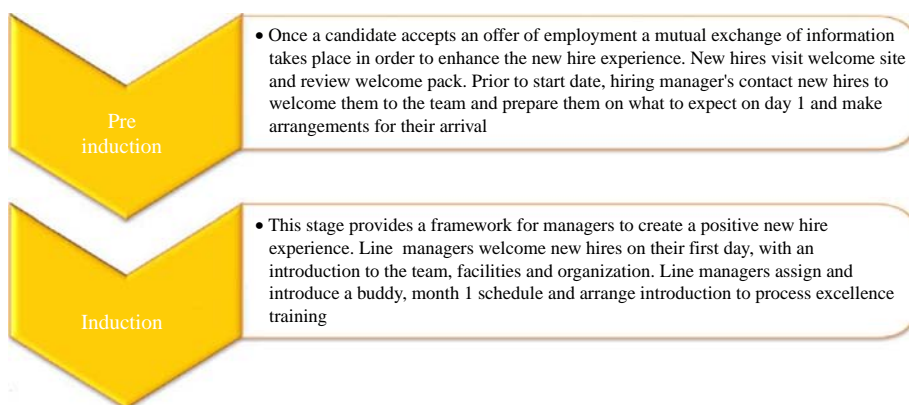


Figure 6. Some of the changes to the orientation process

The above improvements were first piloted in two regions (one US state and one European country) and, after a positive result, they were deployed across all of the corporations.

Control phase

All these actions were implemented and turnover levels monitored in the following months: a monthly employees' turnover report was produced for each business unit, highlighting the percentage of voluntary turnover for each business unit over the previous month (Table II). The overall, corporation wide, employees' turnover rate decreased from an average of 35 to 25 per cent.

A "C-Chart" control chart was developed to monitor the employees' turnover level over the last 24 months (Figure 7).

Each employee that voluntarily leaves the organisation can be considered as a non-conformance, within one subgroup, of the process and for this reason the C-chart was chosen among the various types of control charts (Montgomery, 2004): also visible in the chart is a drop in the employees' turnover rate in the last six months.

A drop of 10 per cent in employees' voluntary turnover resulted from the activity of the project: 559 employees voluntarily left the organisation, instead of the 783 that would have if the turnover rate stayed the same.

The cost to replace each departing employee was estimated at \$5,000: so the cost savings amounted to about \$1.1 million.

As part of the control phase, the project team also developed a tool-kit, communicated to all HR professionals and line managers in the organisation, detailing the new process.

The new process was handed over to the process owners, who would be accountable going forward: the HR lead in each business unit. Each HR professional was going

Total employees	2,236
Voluntary leavers	559
Employees' turnover%	25
DPMO	250,000

Table II. Process defects after the project

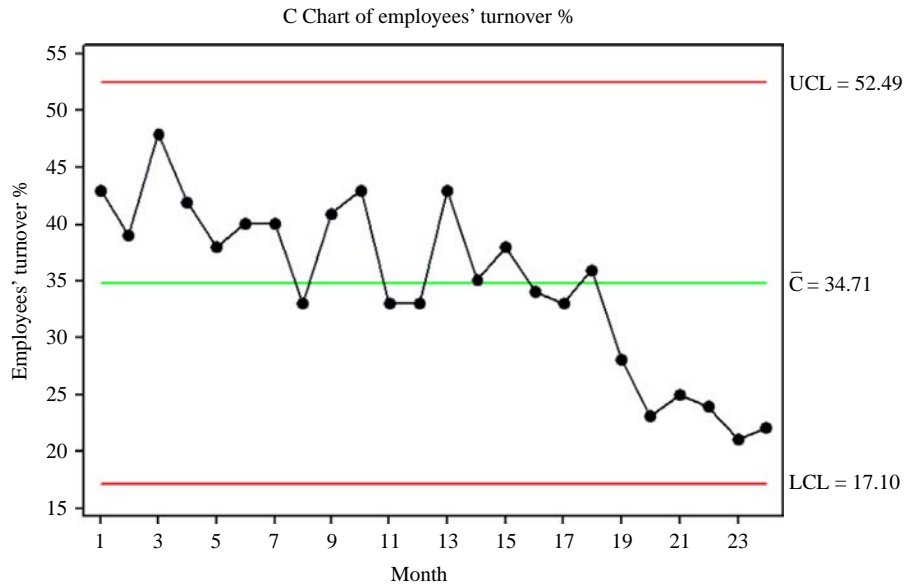


Figure 7.
Control chart "C-Chart"

to be responsible for the ongoing deployment of the new process in his or her area of responsibility.

To ensure its continuous visibility, the key relevant metrics were included into the HR dashboard that senior management can have access to review company's performances.

Conclusion

This paper deals with the application of Six Sigma in HR in a service company. The goal was to reduce the turnover rate from 35 to 25 per cent; independent variables and factors were collected using survey data, and improvement actions determined on the basis of the analysis of these data. The main results were as follows:

- a reduction in turnover from 35 to 25 per cent; and
- cost savings of \$1.3 million on an annual basis.

In conclusion, we can state that Six Sigma can be used to improve administrative processes, such as HR processes: implementing the Six Sigma DMAIC breakthrough methodology in HR follows the same path as implementing it in any other part of the organisation.

However, there are some specific key learning points and challenges to the HR area, such as:

- (1) difficulty in establishing an appropriate measurement system analysis and metrics;
- (2) data collection can be extremely difficult, as the project team is dealing with very sensitive issues; and

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- (3) difficulty to perform any pilot or design of experiment: any of these is going to impact on the behaviour of staff, making it difficult to accurately measure its results.

As a result, projects may last longer than the standard four-six months and a wider use of tools such as brainstorming and “Kaizen” workshops with domain experts may be necessary (Lee *et al.*, 2008).

While this case study deals with employees’ turnover, other examples of potential Six Sigma projects in the HR function are:

- reduction in time and cost to hire a new employee;
- reduction in training costs;
- reduction in cost of managing employees’ separation;
- reduction in administrative defects (payroll, benefits, sick pay, etc.); and
- reduction in queries from employee population to the HR department.

Every area of an organisation needs to perform better, faster and cheaper, to keep the company ahead of the competition and be able to satisfy ever increasing customers’ expectations. HR is no exception: more cost effective and streamlined HR processes will create value for the organisation, instead of just being a support act for management (Gupta, 2005).

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Appendix 1. Employees' questionnaire

Name:		Employee #		Date of Hire:	
Title:				Avg Hours/week:	
Location:		Location #		Date Last Promoted:	
Business (markwith "X"):		HERC	HLE	RAC	Last Day Worked:
Manager's Name and Title:				Vacation Days Owed:	
Please rank each of the factors below on a scale from 1 through 5 showing how they may have influenced your decision to leave Hertz (1 - weakly influenced; 5 - strongly influenced). Then, provide an overall rank for the factor category (1 - weakly influenced; 5 - strongly influenced). For electronic completion, Pull Down Menus are provided to the right of each selection box. Viewable text is limited to 255 characters.					
Influencing Category and Factors		Category		Explanation (write on back if more space needed)	
CAREER GROWTH		1-5			
?Opportunity for advancement ?Clarity of career path and requirements ?Fairness and handling of promotions ?Interest in career path ?Stability and security of job		<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		<input type="checkbox"/>	
WORK DUTIES		1-5			
?Specific job duties and tasks ?Variety and challenge of work ?Requirements and standards of job ?Distribution of workload		<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		<input type="checkbox"/>	
WORK ENVIRONMENT		1-5			
?Work place conditions ?Relationship with co-workers ?Team environment ?Supervisor/staff relationship ?Manageability of workload		<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		<input type="checkbox"/>	
MANAGEMENT		1-5			
?Manager's knowledge and skills ?Consistency and fairness ?Recognition of employee contributions ?Clear communication and direction ?Interest and concern for employees ?Confidence and trust in staff ?Interacts and motivates workforce		<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		<input type="checkbox"/>	
SCHEDULE EXPECTATIONS		1-5			
?Amount of hours required to work ?Scheduled work days ?Scheduled shift ?Amount of hours available for work		<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		<input type="checkbox"/>	
COMPENSATION		1-5			
?Base rate of pay ?Incentive/bonus potential ?Regularity and amount of pay increases ?Accuracy and timeliness of paycheck		<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		<input type="checkbox"/>	
BENEFITS		1-5			
?Vacation/Holiday/Personal and sick days ?Healthcare: medical, dental, vision, etc ?Retirement Savings Plans		<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		<input type="checkbox"/>	
TRAINING & DEVELOPMENT		1-5			
?Orientation was well planned and thorough ?Orientation provided sufficient training to start work ?Encouraged and supported in my development ?Sufficient coaching and training by manager		<input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/>		<input type="checkbox"/>	

Appendix 2. Project charter

6-Sigma Project Charter Document

Project title: Increase employees' retention

Problem statement: Although some level of turnover, following business' seasonality, is desirable, we are currently experiencing unacceptable high levels of employees' turnover, due to an unclear retention strategy and employees' value proposition.

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Linkage to business: The estimated cost of voluntary turnover in 2007 has been \$27.5 millions: an increase in retention will have a significant impact to the bottom-line.

Defect definition / CTQ (measurable): Any percentage point of turnover above what is deemed to be in line with company strategy.

Definition of Project Scope: The project has a worldwide scope, focusing on both Europe and North America divisions.

Project Deliverables / Objectives (Cost / Quality / Timing): increasing HR retention across all divisions is the ultimate goal of the project. To do this the project is divided in seven sub-projects, each focusing on a specific area:

- Attract
- Recruit
- Integrate
- Reward
- Career Paths
- Manage & Engage
- Separate

Enablers: HR staff both in Europe and the US is heavily involved and would need to dedicate atleast 20% of their time to the project.

Performance Metric(s)	<u>Present</u>	<u>Expected</u>
% Voluntary Turnover	40%	25%

Project Champ/BB Meetings Scheduled: Yes / No

Project Champion Name / Signature / Date: _____

Process Owner / Customer Name / Signature / Date: _____

Black Belt Name / Signature / Date: _____

HIP Director Europe / Signature / Date: _____

Master Black Belt Name / Signature / Date: _____

Project Expected Start Date: 14th Apr 2008

Expected Closure Date: 31st Dec 2008

About the authors

Alessandro Laureani is a Statistician, qualified Lean Six Sigma Master Black Belt, Project Management Professional Certified, with strong quantitative background and experience in managing projects in the service industry across multiple countries, focusing on improvements in processes and increasing quality. He has trained over 100 people in the last two years as Lean Six Sigma Green Belts and Yellow Belts. He is currently working as Six Sigma Master Black Belt for a large multinational organization in the service industry and he is also researching Leadership effects on Lean Six Sigma Deployment in organizations, as part of the PhD research within the Department of Design, Manufacture and Engineering Management of the Faculty of Engineering at Strathclyde University. Alessandro Laureani is the corresponding author and can be contacted at: alessandro.laureani@strath.ac.uk

Jiju Antony, Director of the Centre for Research in Six Sigma and Process Improvement (CRISSPE) and Director of Knowledge Exchange within Strathclyde Institute for Operations Management in his 12 years of research career, has published more than 175 refereed papers and five textbooks in the area of reliability engineering, design of experiments, Taguchi methods, Six Sigma, total quality management and statistical process control. He successfully launched the first *International Journal of Six Sigma* and Competitive Advantage in August 2004 and now launched the *International Journal of Lean Six Sigma* to be launched in April 2010 by Emerald Publishers. He has been invited several times as a keynote speaker to national conferences on Six Sigma in China, South Africa, The Netherlands, India, Greece, New Zealand, South Africa and Poland. He has also chaired the First, Second and Third International Conferences on Six Sigma and First and Second European Research Conferences on Continuous Improvement and Lean Six Sigma. His recent work includes collaborations with organisations such as Thales Optronics Ltd, Scottish Power, Rolls-Royce, Tata Motors, Bosch, Nokia, GE Domestic Appliances, Scottish Widow, 3M, Land Rover, GE Power Systems, NHS Ayr and Aaran, Kwit Fit Financial Services, Clydesdale Bank, etc. in the development of Six Sigma, Lean and Continuous Improvement programmes within these organisations. He is currently chairing the Six Sigma Cluster for local companies in Scotland and is a Six Sigma certified Black Belt from the American Society for Quality (ASQ). He is on the Editorial Board of over eight international journals and a regular reviewer of five leading international journals in quality, operations and production management. He has trained over 800 people in the last five years as certified Lean Six Sigma Green Belts and Yellow Belts.