How Managers can Create a Fair Compensation Procedure in the Engineering Sector

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How managers can create a fair compensation procedure in the engineering sector

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ABSTRACT

This research has analyzed the feedback from managers and technicians in high tech companies when doing the individual evaluation of performance using a dual-perspective approach. The research has established a list of categories and subcategories that all managers should include in a fair performance evaluation according to the feedback from different experts, avoiding potential bias described in Messick & Bazerman, (1996) and clearly known in advance by all the employees who will be evaluated. Finally, the paper concludes with an analysis of the potential impact and contribution to the employee’s satisfaction of alternatives methods of rewarding (using four options, money, stocks, time off and other benefits).

In order to accomplish this research, the HDM model has been used, but in a different way than traditional HDM model. This research has used a multi-mode or dual-method, combining a top-down approach with a bottom-up analysis. The first HDM analysis has included a group of experts who have been in manager position and second HDM analysis has assessed a group of technicians. The outcome will show the preferred compensation for each group and if there is any, the gap on preferences between both groups, together with an analysis of each criterion and sub-criteria weights according to the respective group.

Future research might focus on a potential analysis about how to solve the previous gap, prioritizing the generation of an automatic tool to conduct all the evaluation process. Additional analysis with a wider geographical scope could be also included.
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INTRODUCTION AND BACKGROUND

Most companies have been using individual performance mechanism to evaluate their employees, and as described by Shumpeter, (2016) they may continue using them for a while even when there is no clear evidence about the effectiveness. Incentive compensation programs are primarily used to promote efficiency and productivity of the workforce, but they can also be used by organizations to enhance employee recruitment, engagement, retention, and employer branding.

Looking into history, the usage of compensation programs and performance evaluation has its origin in the middle age, and it was the Spanish founded religious order, Jesuits, the ones that first documented its usage (Brazzolotto, 2012). But what exactly is a performance evaluation? Lansbury, (1988) defined it as “the process of identifying, evaluating and developing the work performance of the employee in the organization, so that organizational goals and objectives are effectively achieved while, at the same time, benefiting employees in terms of recognition, receiving feedback, and offering career guidance”. There are three actions that should be relevant for any research on this topic: “identifying”, because it is the first step to figure out what are the skills, metrics, or abilities to be evaluated; “evaluating”, which is the action that provides the performance results; and “developing”, after any evaluation there should be a plan to improve the performance in case it was negative or to reward a high performance to keep the employee producing at high rate. Therefore, according to the definition, the outcome should produce a mutual benefit for the company and the employee. For the company higher performance should
lead to more productivity, and for the employee higher performance should lead to economic benefits and as well as career guidance and evolution.

However, the evaluation methodologies, the way that employees are “scored”, and the reward compensation mechanisms have been long questioned because of their efficiency. There are studies (Behn, 2003) which highlight that outcome of the performance evaluation should be specifically directed to the improvement on specific goal from managers respect to an employee. It means that performance evaluation should be different for each employee based on what a manager is expecting from him/her, and a specific set of objectives for each individual. But this situation would lead to a very complicated and tedious mechanism where managers would be more human resources oriented employees than managerial focused employees.

In general, and complementing the previous ideas, individual performance evaluation is also a tool to obtain the health status of the company through the measure of the health status of each of the individuals that belong to the company. Besides, it can also help to obtain and evaluate the happiness of the employee, which is a direct factor in the overall company health. This information may help to also find out projects underperforming based on individual feedback and prevent a high employee turnover which involves an extra indirect cost for the company (Hinkin & Tracey, 2000).

Companies cannot forget that individual talent is great, but it can’t turn company’s high-performance employees into stars, Mankins says: “We could try everything we
want to emulate the habits of highly effective individuals, but it doesn’t matter what we do individually if it runs counter to how an organization gets work done”, therefore “Top-performing companies focus on collective instead of individual”. Hereby, the performance evaluation is once again conceived as a different evaluation per employee with a target beyond the individual evaluation but to make the evaluation an inclusive measure to reduce the gaps between the highest best percentile and the average.

Therefore, it is clear that evaluation performance is a critical activity within companies and that an improvement on the current methodologies is required. This research analyzes one of the most complicated “non-technical” situations where decision making for managers is beyond their technical or managerial skills. The perception of unfairness by employees, or the lack of happiness with work compensation, can lead the employee to look for a new job, increasing the not desired turnover. This phenomenon is especially high in IT and high-tech companies (Purohit, 2016). Employees are aware that they are living in an unfair world, but they expect to be treated fairly by their managers and the company where they spend most of their week time (Tanner, 2018). This paper pursues to establish a baseline for a mixed compensation method, with several metrics/inputs that should be weighted differently based on individual pre-analysis.

COMPENSATION OPTIONS

Reinforcement theory states that a response followed by a reward is more likely to recur in the future (Thorndike’s Law of Effect). However, the scope of this paper is
to review several options of rewarding and avoid the tyranny of a single option like money, which has been the traditional most adopted method. Previous research has concluded that compensating a high-performance employee makes a later high performance more likely. But there is also a potential negative consequence when high performance is not followed by a reward (Gerhart, Minkoff & Olsen, 1995).

There is a trade-off to be considered when deciding to or not adopt a compensation methodology in a company. The decision to introduce a mechanism to evaluate and reward performance has to be analyzed as a long-term mechanism. Otherwise, a compensation methodology established during a short period of time and later on canceled may create more damages than benefits as explained by Gerhart, Minkoff & Olsen (1995).

This research has selected four different types of compensations methods, after talking with several experts and perform an intense literature review, concluding with “Money”, “Stocks”, “Time” and “Others” as four final options. All they will be the weighted by the different experts, paired with a set of criteria and sub-criteria parameters confirmed by a group of experts that will be explained more in detail in the Data Analysis section. These options are not mutually exclusive and a combination of them is, in fact, an option and probably a more effective method than a single compensation option. As part of a future research, might consider the creation and evaluation of a software tool to design the most efficient weight distribution to each of the criteria, sub-criteria and compensation methods. This tool
could be also personalized, and individualized in order to create a most accurate
evaluation for individual employees.

But let’s analyze each of the four possible compensation methods:

**Money.** This is the most traditional compensation mechanism. The majority of
the companies that carried out a performance evaluation of their employees have
been using this option for several years. There are plenty of reasons why it has been
the most widely used compensation mechanism, among them we can say that it is
easy and it shows a short-term effect on employees. Money is the core of the
modern society and money is a tangible asset. However, money per se is not a good
tool to increase employee’s performance and it is not even perceived as the main
reason why employees perform well at their jobs (Judge et al, 2010).

**Stocks.** This way to compensate the performance is backed by the argument
that exposing an employee’s wealth to the firm’s stock price will create incentives for
the employee to work harder, it is especially evident in companies and roles that
involve a certain degree of innovation (Chang, et al 2015). Even though it has been
especially used by startups, which have no capital to compensate their employees
with cash, big companies in IT sector have been also using this method for a long
time. If we analyze this method, comparing employees and company perspective,
the first conclusion is that stocks as compensation mechanism mean more
complexity for employees than for the company. Since there are different types of
stock options and not all employees have an investment background and financial
culture, this option may require an extra degree of communication and explanation
from company to the employees. The employees must be fully aware whether their stocks are vested and will retain their full value even if they are no longer employed with that company and what type of taxes implication they have. Employees must consider the scenario when stocks are subject to tax withholding, which may lead to a tax payment in cash, even if the employee was paid by equity compensation. It will make the employee use its own cash to pay now for a future compensation that will be materialized when the employee sells the stocks.

**Time.** Providing more paid time off can, paradoxically, increase employee productivity (Heymann, 2014). Increasing job satisfaction, reducing stress levels, and improving job focus are all possible positive effects of providing more paid time off. However, in this case, unlike stocks, the complexity is transitioned to the company. Planning activities with fewer employees require additional management and increase of risk due to lack of resources.

**Other.** There are several alternatives or non-traditional methods that could be adopted (Heymann, 2014). They include, among others:

a. Facilitating additional courses or training for employees pursuing certifications. The benefit obtained is directly received by the employee but there is an indirect benefit for the company having a more skilled employee.

b. The compensation may include partial or complete payment of the certification or school program, flexible job schedule to attend the classes or a combination of both.
c. Depending on each individual case, for employees with kids, pre-school fee payments could be offered. This option was highly recommended by some of the experts.

d. To promote the internal team building, company activities like group traveling or social activities like dinners could be offered too.

To summarize, using the feedback from managers and technicians, this research tries to figure out what is the best criteria, matching the different preferences from each both group in order to select the compensation method. Additionally, this paper highlight what are the main categories and subcategories that should be included in the performance evaluation. The outcome of this research weighs the benefits associated with each option (money, time, stocks and other) evaluated by both groups (managers and technicians). This situation reflects a typical decision-making scenario, where multiple inputs must be considered and evaluated before the decision is taken. People facing this situation, generally managers, have to evaluate the performance of their employees and sometimes the human bias mentality and our lack of capacity take decision completely decontextualized may lead to not the best decisions. Through the use of decision-making tools, like HDM, this paper intends to minimize these bias effects introduced by the humanly limited capacity to be completely abstracted from the environment. HDM is a structured method to strongly support the outcome of the decision making (Clemen et al, 2014).
LITERATURE REVIEW

As a side effect of the main purpose of this research, an outcome of this research could be a future research to analyze a possible correlation between a high turnover and the compensation evaluation mechanism in these companies. The analysis should focus on a combination of several sources as contributors to such outcome. Among other reasons, there is an initial problem related to the wrong or not proper individual hiring process. If the person hired is not the most accurate for the vacancy, even when the compensation for his/her performance may also influence on his/her satisfaction, the problem is already there and the compensation will not solve it. In this scenarios, the compensation is just a short-term satisfaction. Or in other words, it has no capacity to solve the problem in long-term, but it has the potential influence to make it worse. Therefore, the method to hire the correct employee should be optimized (Brigham et al, 2005).

There are several studies already done regarding the compensation and performance evaluation criteria using AHP. An interesting approach was done by Liu et al, (2005) to evaluate the performance of a small business unit. We could assume that in a certain way, each individual in a company and within a department could be considered a single business unit. In this case, using the parallelism from Liu et al (2005) research, most of the metrics should be qualitative metrics to evaluate the outcome. But adapting the method with slight modifications from the original one, a company could create a new performance evaluation criteria for employees.
The compensation analysis is not a simple process, this should not be surprising: pay for performance is a complex process that demands a large investment of time and resources from companies who seek to use it. The effectiveness of a pay for performance system can be undermined by flaws in the design, implementation, and operational phases (Designing an effective pay for performance compensation system: a report to the President and the Congress of the United States, 2006). An ongoing analysis of each employee that includes the results of the previous evaluation can help to ensure a more positive performance outcome in time.

A similar research focused on the evaluation of the performance instead of the compensation method was done by Islam & Rasad, (2006). This research evaluates employees performances based on six criteria: quantity/quality of the work, planning/organization, initiative/commitment, teamwork/cooperation, communication and external factors.

As in all model, the scope of an evaluation must be first identified and then, there is a need to define the weight and evaluation method. This process involves an identification of all the attributes which are perceived to be significant in evaluating employees (or potential candidates to be hired). These will vary somewhat from one hiring entity to the next, and from one rating individual to the next. Once the attributes have been selected, they must be weighted (Taylor, Ketcham and Hoffman, 1998). But the way to weigh each criterion, the importance of every pairwise comparison is where the complexity lies. For that reason, AHP is a tool that helps to generate such weights automatically after processing the experts' feedback.
A second problem associated with the categories and subcategories used, is that some of the attributes are completely quantifiable, some are partially quantifiable, and others are completely subjective (Taylor, Ketcham and Hoffman, 1998). It makes that comparisons are not completely fair in some scenarios.

Much research has been done in the last 30 years analyzing compensation and performance, looking for the positive or negative effect. However, compensation methods have not changed much (Kohn, 1994). This paper tries to move forward on this topic and trigger a new discussion about the tools to develop a fairer methodology.

**DATA ANALYSIS**

The hierarchical decision model has been widely used for similar purposes than this research, performance evaluation, as explained in the literature review. But none of them has combined a top-down and bottom-up approach to figure out whether a potential gap between managers and employees could affect their long-term relationship with the companies. The HDM model was selected for its capacity to create a quantitative outcome for a set of qualitative and quantitative inputs. These qualitative and quantitative inputs are the result of several experts’ feedback, literature review and the researcher own experience.

The initial model was the result of the previously mentioned literature review, together with my experience during more than 12 years working in IT sector. I worked more than seven years in a technical position not involving people
management and the last four years as a manager with several people reporting to me. This first model included five main criteria and several others sub-criteria. This initial model was shared with a set of experts who provided their feedback too.

Combining experts' feedback with the initial model, the final model was developed and shared with experts in managerial positions and engineers with no managerial responsibilities.

**Initial Model and Experts feedback**

The initial model, obtained after a careful literature review, was shared with experts and included the following criteria and sub-criteria.

![Figure 1. Initial HDM structure proposed by the research](image)

In order to not influence the experts and create a potential cognitive bias, like “Confirmation bias” (Nickerson, 1998) or “Validity bias” during this phase, the experts consulted to gather the initial feedback about the model were not the same as the experts to complete the final HDM model. The participants have chosen to provide
feedback and help to improve the initial model were a wide variety of experts from engineering sectors, Human resource departments, project management position, and technical experts. Additionally, one Ph.D. in Psychology was also consulted in order to include a behavioral approach to the model assessing.

Among their feedback, there are some interesting points that should be reflected in the future model and are highlighted below:

“Extra Curriculum”. The name was updated to “Professional Development” to provide a more accurate definition, and a new subcategory was added under it. According to one of the technicians who provided feedback, there are certain courses that do not provide any official certification but are related to the technology sector, and are therefore important to consider.

“Feedback” was updated to “Performance Review”, because this category was collecting qualitative input from different actors who work on a daily basis or at a certain point with the individual during the evaluation period. Additionally, two new subcategories were added. “Other Departments”, because according to a Project Manager opinion, nowadays, an employee has to collaborate with multiple departments during projects. These departments are independent and therefore their members are different from the employee’s work team. Finally, a self-review input was also recommended, in this case by a human resource expert. This option, according to expert opinion, is useful also to measure the discrepancy between the individual and the environment.
“Subjective Metrics” was updated with the addition of two new subcategories. For this category, there were several proposals and sub-criteria proposed, but some of them were too generic, like the initial sub criteria “quality of work”. The final decision was to include “team building” and “conflict resolution” because of the direct correlation between them and teams performance (Porter & Lilly, 1996). One point increase in conflict, decreased 5.8 points in the performance, which makes these two features clearly important to be considered regarding employees.

“External Activities” are not a high interest for most of the employees. A couple of experts from the managerial group and one human resources expert consider them important at a certain level and should be part of the model. The only change within this category was the naming of “Sports Practice” to “Personal Fitness” to highlight that it was related to the healthy habits of the employees. Much research has analyzed the correlation between employees practicing sports and having healthy habits with the reduction in absenteeism and medical leaves (Gebhardt & Crump, 1990).

Final Model after Experts feedback

After collecting and analyzing the feedback from different experts and performing a wider literature research, the initial model was updated to include all the new concepts. The result was a wider HDM model with a wider perspective, including more than only economic and traditional criteria.
The final model built is shown in the following graph, and each criterion and sub-criteria are explained in detail later on. Finally, the four potential outcomes are described.
Figure 2. HDM Final Model
Metrics (KPIs). Key Performance Indicators. It represents a direct and quantitative way to evaluate the performance. A set of measurable and realistic objectives are given to the employee, department, and company at the beginning of the period when the performance will be evaluated. This criteria refers to the percentage of accomplishment for these objectives and is probably one of the most widely adopted (Ballard, 2013). The idea of having several sub-criteria intend to compensate the weights among three contributors. In a globalized world, the success of an individual is usually related to its department’s success or vice versa, and likely the department is with the company. Therefore, a distribution of weights between three factors will compensate the potential outliers where one factor overcome the others two. The three sub-criteria are:

- **Individual**: Specific KPIs to measure the individual contribution. This KPIs are set at the beginning of the period to be measured and they are agreed between the direct manager and the technician.

- **Department**: These KPIs are established for the whole department. They must be also public and available for all the members of the department.

- **Local/National**: Following the same criteria as the previous sub-criteria, there should be a performance evaluation for the company at the local/national/global level.

Professional Development. In this criteria, the objective of evaluating the self-motivation of the employees is the main target. In a super competitive world, technological companies need to have employees up to date with the latest
technology trends and tendencies. It is especially important for this sector, engineering, where all the technicians and managers work. Besides the technician benefit, the company gets also benefits in several ways from the employee’s high motivation for continuous learning. Furthermore, this motivation for a career evolution is what makes this category so important to be included (Griesser, 1993)

- **Certifications.** Completion of courses outside of the company that provides certifications in related areas. Certifications are obtained out of working hours, and the final certification is issued by an official school, company, program, etc.

- **Internal Trainings.** Company sponsored training related to the employees’ work.

- **Other Courses (related to work).** Courses or programs outside of the company and working hours that do not include any final certification but are related to the sector where the employee work.

- **Other Courses (not related to work).** Courses or programs done by the employee outside of the company and working hours that do not include any final certification and are not directly related to the sector where employee developed his career. E.g. language courses,

**Performance Review.** Previously, the KPIs were included as a quantitative feedback for individual performance. However, it is also important to include a qualitative review from other employees or staff evaluating the individual contribution to the company of the technician.
• **Direct manager.** Evaluation from the direct manager regarding the individual performance.

• **Co-workers (same team).** One-third of the team members evaluate the employee. That third will not take part in subsequent evaluations until all the team has participated once.

• **Customers.** When the employee works with the customer, a survey will be provided to evaluate the quality of service provided and customer satisfaction.

• **Other departments.** In many cases, employees need to support other departments in the company. Two people from any department that the employee has collaborated with during the evaluation period will participate in the evaluation.

• **Self-Review.** It is important to know also what the employee thinks about his/her performance. This self-evaluation helps the company to find gaps between what employee understand about his role and performance and what others (including the co-workers and the direct manager) perceive from the employee.

**Subjective Metrics.** Besides direct performance metrics, the way the individuals carry out their tasks has a direct impact on their co-workers, other departments that employees collaborate with and people around them in the company. This impact could lead to a negative or positive result in others departments or in the relationship with co-workers. In general individual’s attitude may influence the performance of others, either in a positive or negative way. Thinking and getting feedback about their
indirect impact on others may help to improve the quality of place to work on a company. The sub-criteria used are:

- **Conflict Resolution.** Human relationship is complex and usually influenced by our unconscious mistakes and limitations. The capacity to empathically discuss, face and dismiss daily problems at work, the capacity to positively deal with customers without conflict is a skill that should be rewarded by companies.

- **Time Management.** Time management is one of the three approaches most studied to improve operations performance, together with supply chain management, and quality management. In this case, time means, “just on time”, not before or later (Kannan, & Tan. 2005). The capacity of employees to do things on time helps companies to work like a perfect engine avoiding unsynchronized situations between employees or departments which can cost money.

- **Team Building.** Healthy companies support and encourage employees with an open-mindedness and team approach. Employees spend almost 1/3 of their life at work, with co-workers. A productive relationship between members of a team leads to higher department productivity.

- **Company Core Values.** All the companies use their core values as strategic guidelines. When all parts of an engine work cohesively, the engine produces its best performance. Similarly, when all employees follow the company’s principles or values, the company is more likely to consistently succeed.
Therefore, it is important that employees are aware and committed to the company strategic vision.

**External Activities.** Behavioral economics is becoming a strong factor in our capitalist society. The introduction of new metrics to evaluate performance may not be limited to evaluate direct activities or tasks performance related to the job, but also external activities that can create an indirect impact in the way we perform or accomplish our work (Baker et al, 1998). A healthy employee will be more productive than someone who doesn’t care for his/her physical health, an employee with high concerns about its society will be more willing to get involved in the resolution of internal conflicts in the company than someone with less concern. After analyzing different experts input, the set of sub-criteria are:

- **NGO collaboration.** Collaboration with a non-profit organization is a signal of commitment to a better society and a response to the increasing Corporate Social Responsibility movement. People who collaborate and participate in non-profit organizations has proven to be more motivated at work (Rodell, 2013).

- **Personal fitness.** Healthier, happier employees tend to be high performers and great team players, ultimately contributing to business goals. That’s why employee wellness programs have become so popular in the workplace.

- **Company Social activities.** According to a recent survey, 58% of men and 74% of women would refuse a higher paying job if it meant not getting along with coworkers. Social activities in company help to improve the relationship
between team members and lead to a healthier work environment (Fermin, 2015).

After review all the inputs, the outputs are the remaining criteria to be analyzed. The potential outcomes, “Money”, “Stocks”, “Time” and “Others” were already described in “Compensation Options” chapter so there is no need to review them once again. For more information, the reader should go back to “Compensation Options”.

TOP-DOWN ANALYSIS, THE MANAGERS

There is a gap between managers, human resources and employees about the methodology, the evaluation criteria and finally, the compensation reward used. This uncertainty can create stress and in certain cases an unfairness perception among the employees which can easily turn into unhappiness and feelings of discrimination, or in some cases even to lawsuits. It is clear that managers evaluate certain things, certain criteria, like skills, KPIs or metrics from employees and employees perceive these criteria differently or consider their importance differently from their managers. Therefore, this is not only a problem about the performance evaluation but beyond that, it is about the relationship between managers and employees in long term too (Clausen et al, 2008).

On the other hand, companies can be too focus on economic rewards when there are other alternatives that in certain situations are more attractive to employees. Managers are comfortable following a traditional approach when deciding the
compensation methods and the performance evaluation, basically following the guidelines from human resources department. There is a need to coordinate managers, human resources and employees to create a methodology that takes into consideration the interests from each of these three groups to create the best model for the interest of the company.

Experts Feedback

Before looking for the experts' feedback, this research defined a minimum criteria that all of them should have to be electable. The idea was to homogenize this group as much as possible, avoiding potential out layers or inconsistency among them. There were five criteria to be considered when selecting the experts from managerial positions:

- **Professional Career.** Experts should have more than 10 years of total experience.
- **Managing people.** Managers should have managed people for at least during 5 years.
- **Companies.** They should be working in companies with more than 100 employees or Tier-1 companies.
- **Geographical limitation.** In order to avoid cultural differences, the research is focused only in Spain.
- **Engineering background.** The managers belong to engineering companies, IT, Telco, Big Data, Cloud, etc.
With all that information, the research used the feedback from ten experts. The list of them, with their position and years of experience is listed below:

- I. O., Senior Project Manager in Vodafone Spain. +15 years experience
- J. S., Roaming Services Director in Telefonica Spain. + 20 years experience
- J. R., Executive & Senior Consultant, Blockchain Technology on International Roaming in MNO. + 20 years experience
- J. R., Head of Sales Department in Ayscom Technologies. 12 years experience
- J.M.R., Senior Project Manager in Huawei Technologies. +15 years experience
- M. R., Senior Software Program Manager in Fagor Electronics. +15 years experience
- N. C., CEO of Carteradeinversion.com and Manager in Mercadona S.L. 10 years experience.
- V.D., Project Director in Huawei Technologies. 12 years experience.
- J. E., Technical Team Leader in MasMovil. 10 years experience.
- J. G. Senior Project Manager in Huawei Technologies. 13 years experience.

All these experts were requested to complete the HDM model considering what would be their preferences in order to evaluate their employees. They were also asked about the method they would prefer to use as a compensation after evaluating their employees’ performance. The results obtained are shown below:
In this case, the disagreement level between experts is 0.061, which is high but still far from the maximum to be considered as a non-reliable model. There is no a clear clue to explain why the disagreement is high in this test. On the other hand, looking at the table below with the “mean error square”, the value 0.045 tell us about the quality of the model, and with a 4.5% the model is an acceptable one.

Finally, to conclude with the reliability of the analysis, the F-Value obtained by the model is 6.77 which is higher than the standard F-Test value consider for the accuracy of 95%, which in this case is 3.01. Going more in detail, the model created and experts' feedback has produced a statistical significant result even above 99%
of the cases (p-value 0.01) which highlights the quality of the response and the model. In overall, the robustness of the research is guaranteed according to the previous results.

**BOTTOM-UP ANALYSIS, THE TECHNICIANS**

As mentioned previously, the uncertainty about the evaluation method and the way the employee is rewarded can create stress and unfairness perception among the employees. In a customer-centric tendency for most if not all of the companies, if not all, the idea that employees are first has been a revolution approach (Nayar, 2010). It turned the hierarchical pyramid upside down by making management accountable to the employees, and not the other way around. HCTL is an example of a successful company following this, and following a transformation that has made it one of the fastest-growing and profitable global IT services companies and, according to BusinessWeek, one of the twenty most influential companies in the world. Therefore, if employees are becoming a central part of company’s strategies, the same companies should listen to what their preferences are in term of compensation and performance evaluation.

**Experts Feedback**

To collect the feedback from employees who are not involved in any management position, this paper has also considered five criteria to select them as part of the group of experts:

- **Professional Career.** Experts should have been in a technical position which does not require people management for at least 5 years.
• **Companies.** They should have been working in companies with more than 100 employees, or Tier-1 companies. (like Telefonica, Vodafone, Huawei..)

• **Geographical limitation.** In order to avoid cultural differences, the research is focused only in Spain.

• **Engineering background.** The employees should work for an engineering company, IT, Telco, Big Data, Cloud, etc.

With all that information, the set of experts who contributed to this research were:

• C. A., Senior Customer Engineer at CheckPoint. +10 years experience

• E. R., Core Software Product Expert at Huawei Technologies. +10 years experience.

• E. G., Software Technical leader at Red Hat. + 15 years experience.

• F. E., BSS Senior Technical Leader at Huawei Technologies. 10 years experience.

• J. M., ICT Technical Lead Business Transformation at Amdocs. +10 years experience.

• J. M., Senior Analyst at Banco Santander (IT Department). +10 years experience.

• L. V., Senior Network Solution Specialist at HP Spain. +15 years experience.

• S. S., Senior Automation and Control Engineer in Acciona. +15 years experience.

• A. V., Senior Software Developer at Huawei Technologies. 8 years experience.

• A. G., Senior Customer Support at Huawei Technologies. 7 years experience.
• M. M. P., Customer Support and Project Deployment at SIA group. 5 years experience.

      Likely with managers, all the technicians’ experts were requested to complete the HDM model, but with a slight difference in the initial question respect to the managers. They should weigh their preferred criteria in order to be evaluated and what would be their preferred compensation method after their performance valuation was completed. The results obtained are shown in the next graph:

![Figure 5. Technicians HDM outcome](image)

There is a disagreement of 0.062 which is slightly high but within the accepted limits. It is interesting that disagreement is almost the same than the one obtained in the Top-Down analysis. In this case, the differences in ages of experience among the experts could have affected the outcome. However, we cannot conclude with a proven correlation between ages of experience and this high disagreement, but later one on this research this factor will be analyzed. Regarding the individual inconsistency, there is only one case that could be considered as an outlier due to
the deviation from the mean 0.03, showing an inconsistency of 0.08 which is however still below the safety limits.

![Table]

<table>
<thead>
<tr>
<th>Source of Variation</th>
<th>Sum of Square</th>
<th>Deg. of freedom</th>
<th>Mean Square</th>
<th>F-test value</th>
</tr>
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<tbody>
<tr>
<td>Between Subjects:</td>
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<td>3</td>
<td>0.067</td>
<td>9.67</td>
</tr>
<tr>
<td>Between Conditions:</td>
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<td>0.000</td>
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<td>Residual:</td>
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<td>30</td>
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<tr>
<td>Total:</td>
<td>0.41</td>
<td>43</td>
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</tbody>
</table>

Critical F-value with degrees of freedom 3 & 30 at 0.01 level: 4.51
Critical F-value with degrees of freedom 3 & 30 at 0.025 level: 3.59
Critical F-value with degrees of freedom 3 & 30 at 0.05 level: 2.92
Critical F-value with degrees of freedom 3 & 30 at 0.1 level: 2.28

Figure 6. Technicians HDM model significance

To conclude, looking into the table above, the "mean error square" is 0.067 which is higher than the same table for managers. This means that the previous model is more consistent and feedback from managers is slightly more reliable, but not significantly better. There may be several reasons, but one could probably be the more homogeneous set of profiles used for managers than for technicians.

Regarding the F-Test value, for the technicians, the value obtained is 9.67 which is also higher than the F-Test value expected for 95% accuracy, 2.92. Therefore, the model and experts feedback could be considered also as statistically significant. In this case, the ratio F-Test value obtained versus F-Test value expected is 3.31 times compared with the managers experiment where it was 2.21, highlighting that technicians result is statistically slightly more significant. In overall, the robustness of the second group on this research is also guaranteed.
COMBINED OUTCOME

Before combining both results, from managers and technicians, we have to analyze the potential influence of outliers in the results. In order to figure out whether any outlier may affect the results of this research, this paper has introduced a comparison between mean and median in the next graph. The Figure 7 shows that there is no big difference between both metrics, and therefore the outliers were not skewing the results.

Figure 7. Comparison between Mean and Median for Outcomes

The combined outcome intends to equally weigh the preferences from the managers and the employees. It is not part of this HDM model, and there is no evidence about the potential disagreement if all the experts’ feedback (managers and technicians) were asked the same question and their feedbacks were processed under the same HDM model. However, the purpose of this combination intends to show a balanced model, diluting the difference between the 2 experts’ groups while
combining them into a single one. The combined results are represented in gray color in the next graph.

![Graph showing combined results for Managers, Technicians, and Combined](image)

Figure 8. HDM models outcome for Managers, Technicians and Combined

The combined result reduces the weight for "Time", but still, it will be scored as the second preferred option. We could say that combined result is closer to the technicians' results than managers' result.

**RESULTS ANALYSIS**

**Gross Results**

Initial results could be divided into four groups according to each of the alternative outcomes available. Additionally, the paper has included two different expert's groups to analyze their feedback, managers, and technicians. The following graph is an intuitive way to see the result of the whole research in a quick look at it.
Figure 9. Comparison of outcomes from Managers and Technicians

As a summary, Money is the clear winner as preferred compensation method for both groups, and Other Rewards the less one. For all of the outcomes, a set of particular differences between managers and employees are highlighted and analyzed below. This paper has tried to understand what could be the reason behind these differences, using the expertise direct feedback.

**Money.** It is the clear and highest preferred option for both groups. Even though there is much research pointing out that money is a short-term motivator and not the best mechanism to motivate employees, (Deci, Koestner & Ryan,1999). It is even considered to introduce some negative impact in some scenarios. But the result of this research, in a contradictory way to previously mentioned research, proves that for both, managers (who must decide the compensation mechanism for its employees, 35%) and technicians (who must receive the compensation after individual evaluation, 33%) the money is the most important compensation option.
 Stocks. It has a higher acceptance among managers (23%) as a compensation mechanism than among technicians (20%) as a reward option. The HDM model did not mention it, but according to direct feedback from experts (especially from employees), stocks are still seen as a complicated tool by certain segments of the population. The risk aversion theory (Tversky & Kahneman, 1991), and the perception of lack of security which is still embedded in the stock market are two big barriers for its acceptance. We could also found explanations looking into the human “temporal discounting” and the preference for lower amount now instead of higher value in the future, which involve higher risk. This human behavior is especially perceived with stock markets (Rieger, Wang, Thorsten, 2015). For all these reasons, this compensation method is not much appreciated by technicians. However, managers perceived it as a good compensation mechanism, probably because it creates a link between the employee and the company. The benefit for managers after the creation of this link is that the employee has to work harder because he owns part of the company, through the stocks received.

According to one expert’ feedback, from the managers’ group, he suggested that stocks should be also used as a retention policy and therefore linked to the time the employee has been working for the company. I found it especially interesting and, variable rewarding based on the employee fidelity to the company may be a part of a separate research.

Time. This compensation method reveals the most interesting conclusion from this paper. There is a big gap between managers and employees regarding their

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Jose Banos Sanchez
preferences for this option, 21% vs 30%. For managers, time-off is scored as the third option in preference, but for technicians, it is seen as the second most preferred one. While having a direct conversation with some experts (managers and employees), the conclusion obtained is that both groups perceive the benefits from this option in a different way. For managers, money, stocks and other rewards are tangible elements provided by the company and not affecting their daily managing activities. The managers are not affected if an employee receives a higher or lower amount of money in a bonus, or stocks or any other reward compensation. However, employees’ time-off is a tangible element with a direct relationship to manager’s work. Employees with more time-off, obtained as a reward, could potentially impact the managers planning activities and could lead them to change their future schedules when the employee claim for that time. The teams dimensioning could be also affected because more people could be on vacation during a peak of workload, impacting project plans and future activities. Therefore, this compensation method has a direct impact on manager’s results and manager’s planning activities.

On the other hand, for employees, once the money is secured by the monthly salary, the time is becoming a very important asset that cannot be bought. Using direct feedback from technicians, and adding an important variable, most of them have more than ten years of experience, the time with family or time for own leisure is sometimes more important than extra money, stocks or other rewards. Once a human has covered its basics needs, secondary needs become the priority.
**Others Rewards.** This category is, in general, the less preferred either by managers (20%) or employees (17%). Among the possible reasons, the uncertainty of a non-clearly defined or tangible option may have influenced the expert’s feedback.

This research proposes a mix among all four compensation method to motivate desirable managerial behaviors according to previous outcomes preferences. The usage of a tool specially designed for this purpose, would add transparency to the entire process and could provide clear inputs and metrics to managers and technicians. It will generate a fairer outcome and less unfairness feeling among employees. This theory and empirical evidence provide significant insights into the complex relationships among compensation schemes, managers' characteristics and manager skills, firm performance, and technician’s behavior.

**First Level. Main Categories Analysis**

The first level in the HDM model represents the main categories to evaluate the performance evaluation. They should be considered as the root nodes from where subcategories append. The HDM model has defined five main categories or perspectives, as explained in the Data Analysis. The following graph shows the
preferences for each of these main perspectives:

Figure 10. Performance Evaluation Main Categories

Let's review one by one all these categories, being the Objective metrics the clear preference for both groups.

**Objective Metrics (KPI).** It is the preferred method by both groups, managers (35%) and technicians (32%). Besides, it has the biggest distance to the next option compared with the rest of categories. This method offers a quantitative mechanism to evaluate the individual performance. It seems that since all the experts are from an engineering background, their perception of measuring specific skills or quantifiable targets is fairer than using other qualitative mechanisms. This was also studied by Rasmussen (1983) concluding that quantitative performance was more adequate for skilled-based and highly trained people.

**Professional Development.** Refreshing the concept definition, the Professional Development concept evaluates the employees' new learnings. There is a significant difference between managers and technicians regarding this criteria. For managers,
this option is evaluated as the fourth one (18%). However, for technicians, this is the second one (22%). Humans tend to appreciate more their own efforts than others do, and they like to highlight their achievements looking for certain recognition. In this case, Professional Development is directly related to the employee eagerness to improve his/her career, dedicating an extra time and effort to get a goal. The employee understands this effort as something worthy of a reward. Nevertheless, for managers, this employees' professional development is out of their control and not visible as part of the daily activities. This is the conclusion obtained after talking with experts and why this criterion is more important for technicians than for managers.

**Performance Review.** The evaluation from direct managers, co-workers and other people who have interacted with the employee has a similar weight for both groups, managers (23%) and technicians (21%).

**Subjective Metrics.** This third option shows the biggest difference in percentage between managers and technicians. Before analyzing it, the word "subjective" may add some bias in the experts' opinion, and therefore should be reviewed in a future research. Technicians (16%) find this option much less important than managers (20%). The idea of a subjective metric of the quality of the work translates uncertainty to the technicians. Since human is risk-averse in general, this option is not desired for people who have to be evaluated. However, for managers the quality of works matters and probably because they have to evaluate these subcategories it makes this group more in favor of a higher weight for this option.
External Activities. There is no special attraction for this option, technicians (7%) and managers (11%), included after feedback from psychology experts. The idea of recognition for external activities not related to work seems something idealistic but not a real option nowadays. However, we know that social responsibility is growing among companies and consumers. Maybe in a few years, this external activities will be seen as something important with a direct impact on the daily job.

Second Level. Sub-categories Analysis.

The results for this level are depicted in the following graphs, firstly for Managers and secondly for Technicians.

<table>
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<tr>
<th>Level-2</th>
<th>OBJECTIVE METRICS (KPI)</th>
<th>PROFESSIONAL DEVELOPMENT</th>
<th>PERFORMANCE REVIEW</th>
<th>SUBJECTIVE METRICS</th>
<th>EXTERNAL ACTIVITIES</th>
</tr>
</thead>
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<td>DEPARTMENT</td>
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<tr>
<td>LOCAL/NATIONAL</td>
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<td>CERTIFICATIONS</td>
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<tr>
<td>INTERNAL TRAININGS</td>
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<td></td>
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<tr>
<td>OTHER COURSES NON RELATED</td>
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<td>DIRECT MANAGER</td>
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<td>OTHER DEPARTMENT</td>
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<td>CO-WORKERS</td>
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<td>SELF-REVIEW</td>
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<td>TEAM BUILDING</td>
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<td>CONFLICT RESOLUTION</td>
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<td>COMPANY CORE VALUES</td>
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<tr>
<td>PERSONAL FITNESS</td>
<td>0.34</td>
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Figure 11. Sub-categories Average Result from Managers
In order to understand the results for each set of subcategories appending to each main category, this paper has drawn different charts for each group and described the results in the following points.

**Objective Metrics (KPI).**

Figure 13. Sub categories under Objective Metrics
In this case, the conclusion is clear and there is no difference between groups regarding the order of preferences. Individual performance is above department and local/national criteria, following that order. If any conclusion should be highlighted, for technicians (53%) the individual percentage of contribution to the total metric (KPI) is higher than for managers (45%). We as humans, in general, tend to overestimate our capabilities and it may explain why technicians gave a higher weight to individual performance over the department, while managers moderate this value respect the other two options. It is also interesting to mention that Individual has obtained the highest weight among all the subcategories. If we notice also that Objective Metrics was the most important category, we can conclude that Individual performance within Objective Metrics is the most important subcategory from this research.

**Professional Development.**

![Professional Development Chart](image)

Figure 14. Sub categories under Professional Development
For this subcategories, the conclusion is clear and both groups agree in the order of preferences and even weights are pretty close to each other. Certifications are the most important metric to be used under the Professional Development. Technicians (42%) and Managers (43%) consider that knowledge should be rewarded and the completion of an official certification is a quantitative way to measure this knowledge. Unlike Other Courses Non-Related which is scored as the last option because is not adding value to the current job.

**Performance Review**

![Bar chart showing performance review](image)

Figure 15. Sub categories under Performance Review

For this set of subcategories, there is no clear conclusion based on the different criteria between managers and technicians. Both groups show a preference for Direct Manager as the highest sub-criteria to be weighed, but the managers (34%) show it with a higher weight compared to the technicians (28%). It is reasonable since this task is actually part of the manager’s job, the evaluation of their employees. A second noteworthy observation is that Customer feedback is scored
as second, which highlight the importance of customers and the fruits of the recent company strategy to be more customer-centric.

Subjective Metrics.

![Figure 16. Sub categories under Subjective Metrics](image)

For Subjective Metrics, in Figure 16, there is a noteworthy difference for Conflict Resolution and Company Core Values. Managers and technicians have concluded with an inversely proportional weight for these two subcategories. For technicians, Conflict Resolution got 28% of the total weight and Company Core Values 16% while for managers is almost the exact same percentage but the other way around. Company core values may sound like something abstract to the day to day work with co-workers, other departments, customers, etc. and as a result of this daily interaction with colleagues, a positive environment is more appreciated by technicians. This is translated into a higher score to Conflict Resolution. However, there is no clear understanding regarding the difference between managers and
technicians and this paper could not obtain any interesting feedback from the experts about it.

**External Activities.**

![Graph: External Activities](image)

Figure 17. Sub categories under External Activities

External activities are not adding any relevant information based on their results. Both groups prefer Company Social Activities as the first option. According to one of our experts, this is a way to do team building and create a better environment in a more relaxed environment out of the office. Following to the next subcategory, the managers consider a healthier employee (34%) more important than an employee with social responsibility commitments (23%). According to one of the managers, a healthy employee will always be more productive than an employee with bad habits and health issues. Furthermore, absenteeism will be lower in the first case compared with the second.
Indirect Analysis of the Results

Complementing the previous results, this research has found out a potential weakness in the results that should be considered in a future research. The experts, from both groups, don't belong to the same age group and they are mainly men. These two particular scenarios may introduce certain bias that should be considered for a potential case update.

It was noticed, that technicians within a lower age range have a higher percentage of interest for money and stocks than other employees in an older age range. The junior technicians selected Money and Stocks as preferred compensation methods above Time and Others, while more experienced technicians selected Money followed by Time. This research cannot define a clear correlation between age and preferences, but this is a significant discovery that is highlighted in the following graph. We have selected the two technicians with less experience, five and seven years:

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<th>TIME</th>
<th>OTHER REWARDS</th>
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<td>0,18</td>
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Figure 18. HDM outcome for Junior Technicians

And we have compared their results with the technicians with longer experience and more than 15 years:

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<th>STOCKS</th>
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<td>0,54</td>
<td>0,13</td>
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</table>

Figure 19. HDM Outcome for Senior Technicians
The result, expressed as the mean for the two groups is:

![Bar Chart: Junior vs Senior Technicians Preferences]

Figure 20. Junior vs Senior Technicians Preferences

The graph shows that senior technicians double the percentage of preference for Time (40%) versus the junior technicians (20%). This enormous difference in the preference for time could be understood as result of the different perceptions/preferences between junior technicians and senior technicians. Looking into some literature, and analyzing more in detail the gap showed by the Figure 20, a potential explanation could be found looking into the following graph:
When talking about working and personal life, we could say that Physiological and Safety needs (Basic needs) are covered by monthly salary. This situation is more significant for senior technicians, who have been working for more years than junior and have probably built the base of the pyramid. At this point, senior technicians are looking more to accomplish their psychological needs like Belongingness and love needs. Family, friends, etc. However, junior technicians are still in the base of the level of the pyramid, and they have not yet built the security required to jump into the next level. That is the reason why this group is still prioritizing the Money and Stocks above the Time.
FUTURE RESEARCH

The paper has firstly focused in a very specific geographical area, Spain. All the managers and technicians that have contributed as experts are working in Spain and have developed most of their careers in this country (even when not all of them are Spaniards). It means that certain cultural bias could be presented in the results of this paper, which may be a topic for a different investigation project. Therefore, a wider research could be done including multiple locations experts or a comparison between geographical areas following the same concept as described here.

A second idea that remains open is the way that compensation should be weighted. This paper had as one of the main targets the analysis of potential gaps between managers and employees when performance compensation methods. But according to the results for each compensation preference, shown as percentages, a deeper analysis of the potential combination of the four options could be done. In some cases like small companies, Stocks are not an option, and therefore a combination of the other three options is the only alternative.

A third idea coming from the direct feedback from experts was about the recognition. Many experts, especially technicians, consider that companies may focus too much on rewards that not include a public recognition. For companies, this should be a priority for many reasons, but mainly because recognition is free and it can complement the rewarding and increase the positive effect pursued.

Looking beyond the results, after an individual analysis is done to each employee in the company, a software tool, capable to adapt the percentages
assigned to each outcome likely to each subcategory could be designed. It will create not only an individual performance analysis but a tool to track the results year after year and show how the compensation help to improve the performance and employees satisfaction. This personalization could create a feeling of “belonging” to the company, helping the employees to feel more like part of it, instead of feeling that they are just employees with a numeric ID.
REFERENCES


doi: 10.1109/TSMC.1983.6313160
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INDIVIDUAL RESULTS

MANAGERS

Expert1

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June 6, 2018
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June 6, 2018
Expert5

Expert6

June 6, 2018
### Expert 7

| Metric | Overall | Leadership | Technical | Communication | interpersonal | Teamwork | Quality/Process | Innovation | Services | Learning | Performance | Direct Reports | Indirect Reports | Performance Review | Subjective Metrics | External Activities |
|--------|---------|------------|-----------|--------------|---------------|----------|----------------|------------|----------|----------|------------|----------------|----------------|----------------|-------------------|-------------------|------------------|
| Weight | 1.00    | 1.00       | 1.00      | 1.00         | 1.00          | 1.00     | 1.00           | 1.00       | 1.00     | 1.00     | 1.00       | 1.00           | 1.00          | 1.00           | 1.00              | 1.00              |

### Expert 8

| Metric | Overall | Leadership | Technical | Communication | interpersonal | Teamwork | Quality/Process | Innovation | Services | Learning | Performance | Direct Reports | Indirect Reports | Performance Review | Subjective Metrics | External Activities |
|--------|---------|------------|-----------|--------------|---------------|----------|----------------|------------|----------|----------|------------|----------------|----------------|----------------|-------------------|-------------------|------------------|
| Weight | 1.00    | 1.00       | 1.00      | 1.00         | 1.00          | 1.00     | 1.00           | 1.00       | 1.00     | 1.00     | 1.00       | 1.00           | 1.00          | 1.00           | 1.00              | 1.00              |
### Expert 9

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<th>Subjective Review</th>
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### TECHNICIANS

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**Jose Banos Sanchez**

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### Expert 2

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**Notes:**
- **Level:** 1
- **Subjective Metus (MU):** 1.5, 1.4, 1.3
- **Professional Development:** 1.6, 1.5, 1.4
- **Performance Review:** 1.4, 1.3, 1.2
- **Subjective Metric:** 1.5, 1.4, 1.3
- **External Activity:** 1.6, 1.5, 1.4

### Expert 5

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- **Subjective Metus (MU):** 2.0, 1.9, 1.8
- **Professional Development:** 2.1, 2.0, 1.9
- **Performance Review:** 1.9, 1.8, 1.7
- **Subjective Metric:** 2.0, 1.9, 1.8
- **External Activity:** 2.1, 2.0, 1.9

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### Expert6

![Performance Evaluation Chart]

### Expert7

![Performance Evaluation Chart]

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*Jose Banos Sanchez*
**Expert8**

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**Expert9**

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### Expert 10

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