

NEOJIBA. THE STEAM BOAT MODEL AND A LESSON IN OPERATIONAL LEARNING

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Abstract

The Neojiba orchestra on tour around Europe. A youth orchestra with unusual working methods, which has had great success. How can Neojiba be made sustainable?

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Introduction

Quality management is the area of operations that addresses learning and improvement. Over the last 40 years, the field of quality management has witnessed the proliferation of many “new” approaches that purport to transcend and improve previous approaches. Examples range from the old PDCA, the fishbone, and the KJ to many other qualitative programs, such as 5S and comprehensive systems that are full of fireworks but somewhat empty, such as Six Sigma. We should recognize that all these approaches are full of good advice and contain many well-meaning ideas, but they sometimes lack a consistent integration into operations systems as a whole.

Much has been written on the topic of achieving improvement. See, for example, (1). Nonetheless, there is a lack of a global theory that shows how to put everything together as a whole, not as bits and pieces. In particular, quality management has claimed the field of learning in enterprises as its own, but it typically does not provide any but the most simple of global conceptual approaches and does not stress the peculiarities of learning and improvement. This approach may be correct in practice because practitioners do not like – or do not have time for – theoretical constructs. However, the field eventually will require some body of theoretical knowledge to provide advanced structure. Currently, there are few models that attempt to organize the ideas that are boiling (or at least simmering) in the field. It is no wonder that practitioners seem to be relying on JIT and TPS manuals (and their derivatives) for inspiration.

In our book (10), a global model of continuous improvement is presented in the context of operations management. The model is fairly simple but with high-level main concepts, which indicates that even when the model suggests a course of action, it does not explain concrete ways to implement it. In this paper, we delve further into the learning side of the model. We are

interested in efficient operational learning (3, 4 and 5) and in implementing operational actions that achieve desired results. We achieve this objective through the specific analysis of an exciting case, the Neojiba Project, in Salvador de Bahia (Brazil), which involves a system of orchestras similar to “El Sistema”, its Venezuelan precursor¹. Neojiba is considered an ongoing successful experience in both musical and social development.

This paper contributes to the literature by identifying a “successful” enterprise, Neojiba, and investigating what makes it successful and what makes it sustainable, with a particular focus on the learning process. We identify isolated actions performed by the enterprise, situating them in a general context that illuminates the operational manager’s role in building successful operations.

We studied the evolution and current situation of Neojiba in detail by living a few days with the Neojiba Orchestra, which was touring Europe at the time. We observed both their procedures and the results obtained by the approach, which resulted in the construction of a simple scheme that we call the Neojiba Model (NM). The NM contains an action-oriented model of the situation (the Steamboat Model) that discloses some drivers of the successful implementation of Neojiba ideas in other real-world situations. We will show that the NM includes many of the driving forces of Total Quality (TQ; 11) and of the Toyota Production System (TPS; 17, 19), although it adopts a more specialized approach². Finally, we draw lessons regarding its business application.

We believe that NM, with its simple implementation, is a tool capable of achieving the same exciting results in other operations fields as it does in the musical domain.

A General Model for Continuous Improvement

Approximately 20 years ago, Perez-Lopez (12) published an important book (unfortunately available only in Spanish) that sets forth an integrated philosophical conceptualization of the manager’s job in an enterprise, based on knowledge and people. The work was largely ignored by the international community and has not been accorded the credit it deserves. Most of the model has not been researched in the usual way, e.g., by appealing to statistics and hypotheses³. Being primarily philosophical, the work is difficult to validate using standard empirical tools. In a sense, doing so would be similar to trying to test Kant’s philosophy (8) in the real world, for example⁴. As in philosophy, most variables are internal and as such are difficult to measure. For instance, one variable in the model is “intrinsic motivation”, which is not primitive but appears as a conceptualization to help explain the reasons why a decision maker might act in a given manner. Like many other philosophy-based theories⁵, intrinsic motivation should be justified in the input-output sense – if you apply a given set of inputs and the model is valid, the outputs

¹ For more introductory information, see “El Sistema” in Wikipedia.

² We have used this approach in companies with excellent results; good absorption was exhibited by the operational managers, who are capable of obtaining good results in a conceptually simple way.

³ It likely does not even require such an approach.

⁴ Is it “TRUE” that “Cognito, ergo sum”?

⁵ Such theories abound in practical management, See Porter (13) for a successful example.

should be “good”⁶ – which has been undertaken by some people by examining cases⁷ (12) that show how Perez-Lopez’s ideas seem to help with an apparently successful approach.

Knowledge Types

Of course, in this study, we do not intend to study all types of learning, so we restrict its scope. To begin, knowledge and learning are action-oriented referents for the main concepts in the analysis. To avoid becoming enmeshed in high-level philosophical issues, the definition of knowledge we provide is formulated in terms of problem solving. We posit that the existence of *knowledge* is demonstrated by the *ability to solve a category of problems*. Therefore, we define “*knowledge*” as “*the ability to solve a category of problems*” (15). Correspondingly, we define “*learning*” as “*an increase in the set of actions available to solve a problem*” (6).

With these definitions, we can see that three different types of knowledge are involved in the development of professional musicians, which are associated with their own types of problems:

- a) The mastery of their instrument, which involve problems in the physical production of *sound*;
- b) The performance of ensemble music, which involves problems related to mastery in the production of *music*; and
- c) The creation of emotion from group sounds, which involves relating to mastery in the creation of *feelings*.

There are considerable differences among those three categories.

- a) The first is primarily an activity of *operational learning*, related to *rote learning*, the learning of an operation normally achieved by reflection and repetition. Physical work, i.e., training the body, is typically involved; as such, it is not a strongly knowledge-intensive activity because it primarily involves the repetition of physical tasks until everything is perfect (i.e., the limit is reached). It is believed that musicians require intensive training for several hours a day throughout their lives. The initial training, which begins prior to going into professional life, typically takes from 6 to 14 years, depending on the instrument. One of the more time-consuming training schedules is the piano because beyond the basic keyboard playing, there is considerable knowledge to be absorbed, such as virtuous playing and accompanying singers.
- b) Producing good sound from an aggregation of a number of musicians is a higher-level activity that involves *group learning*. The focus in group learning is on synchronizing the different sounds in a combination that achieves the right tone and cannot come from a single instrument. Music training requires considerable expertise in an instrument before

⁶ Many people justify the approach because, “The proof of the pudding is in the eating”.

⁷ At the beginning, we considered using a set-theoretical method (like QCA; see 14) to summarize and structure the qualitative data in the planned interviews. We dropped this approach first for logistical reasons. We wanted to spend our limited time with the orchestra to understand the atmosphere surrounding it. Second, the methods are nonetheless fraught with difficulties. A formal method only takes care of formal reasoning, but we felt that we had a blurred view of the phenomenon that initially required just exploratory work. The same might be applied to other techniques, such as C50, correspondence analysis, and the main classical clustering algorithms.

a musician is able to perform effectively in a group and make music for others to enjoy. However, high mastery in an instrument is sometimes not required if musicians restrict themselves to playing the right type of music.

- c) Inducing emotions with music might be the upper echelons of musical excellence. Typically, music students take courses on the work of different music masters, and with the assistance of experts, they develop their own appreciation of the musical art. In a sense, this type of learning is associated with *mentoring in learning unstructured crafts*. In symphonic work, conductors are the main mentors for playing musicians. A good orchestra should be capable of carrying the demands of the conductor. Actually, the conductor strives to produce the sound and feeling the conductor is aiming to achieve. No discussion can be undertaken against the musical ideas of the conductor; the purpose of the players is to understand and achieve the conductor's wishes. Sometimes, the messages are translated concretely – “play this louder” or “play legato” – but they are often transmitted in vague forms that rely on the musicians' experience and on the repetition of passages that are critiqued as the rehearsal proceeds⁸.

In this paper, we mainly keep in mind the *operational and group levels*, i.e., *how do you learn, quickly and efficiently, to play an instrument and to make “good music together”*? This concept is identical to factory operations and can also be analogized to services, such as the mechanical process of selling⁹.

Neojiba efficiently involves and addresses learning. In four months, a neophyte student can play well enough to participate in group work (ensembles). In 3 or 4 years, he can play in YOBA¹⁰. Obviously, YOBA selects the most capable students, taking into account their global abilities much more than just their playing abilities.

The Starting Point

The Perez-Lopez model begins with general postulates on which almost everybody agrees. The two main postulates¹¹ are essentially “people want happiness” and “do unto others as you would them do unto you”. These postulates are translated into business parlance and become “people work better when they are happy in their work” and “justice is a must in business life”. Clearly, this theory cannot possibly be descriptive but is instead normative¹².

The Perez-Lopez model identifies three elements that allow for a complete valuation of the state of cooperative (the general case, which includes competitive) decision making and two types of agents are present: active and passive. Both involve a state that can be thought of as their accumulated knowledge that is usable in future decision making. The first agent makes the initial decision. The second receives said decision and reacts to it either by acting or by storing it in his

⁸ Sometimes, the conductor sings to show what he wants. For a good example, see Carlos Kleiber rehearsing the Overture of The Fledermouse (1970) on YouTube.

⁹ In this context, remember that a few years ago, the operational lower levels of management in banks were instructed to sell sub-prime mortgages without clearly explaining their purpose and effects. The theory was that to sell, they did not need to know more.

¹⁰ Young Orchestra of Bahia, the main orchestra in the Neojiba system.

¹¹ Both have long been publicly recognized by reliable sources.

¹² An additional reason that makes direct testing almost impossible.

internal state, which is essentially a list of observed behaviors that depend on interpretation. The result of an interaction can be evaluated using three (sets of) criteria:

- Efficiency (E): related to the direct effects of the decision and its influence on the physical world of those involved and on the company;
- Learning (L): related to the degree of effect on the passive agent, resulting from implementation of the decision; and
- Integration (I): related to the change in the active agent resulting from the learning of the passive agent. This is a relevant, indirect result that is normally ignored in models of the decision-making process.

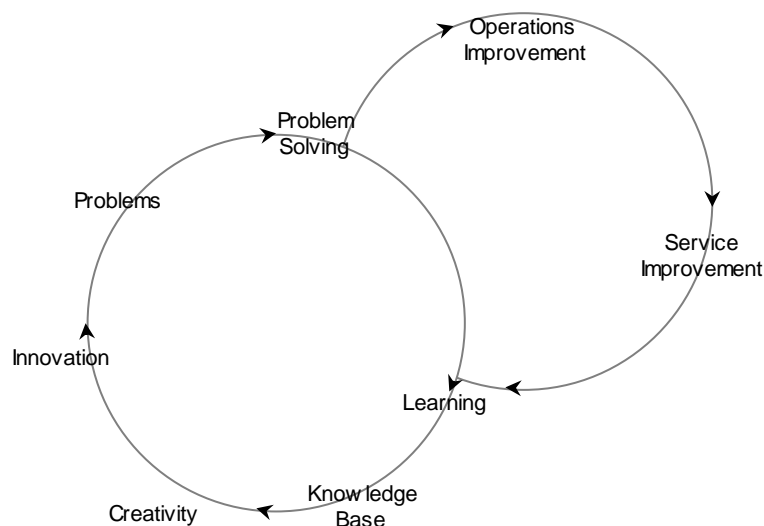
These criteria will be known collectively as “the ELI triad”. Perez-Lopez argues the completeness of the three types of measures and their logical independence. Accordingly, all conceivable criteria that define the quality of an action belong to one of the three above categories, and the categories are logically concluded to be mutually exclusive.

Our Starting Model

We begin from the Perez-Lopez model and introduce dynamics into it, which is required for permanent improvement and is undertaken by postulating the existence of an inventory of knowledge and an inventory of extant problems that the company must solve to survive and progress. In a simplified manner, dynamics come from the interplay of knowledge and problems. Essentially, knowledge is acquired when (and by) solving problems, and its existence leads to (better) solutions for both new and existing problems, which provides new opportunities for improvement. This interplay is represented in Figure 1.

Figure 1

A model for problem solving–based continuous improvement



The arrows represent a (probabilistic) causal relationship between two concepts. We call the left (complete) circle the “inner circle” because it can work in the absence of external interaction, in which case it would have little (or no) “impact in the environment”. The right circle addresses the external world in which the improvement is produced. Here, the actions in the inner circle are implemented and result in both learning and effects on the environment. Both cycles are unsynchronized and normally run at different speeds.

The diagram attributes a key role to *innovation* as both the root of all improvement and the main producer of problems. Let us remark here that many current business buzzwords appear here. In current business practice, they are treated as isolated objects that respond to some type of theory. We imply that such buzzwords must live and cooperate in any process of improvement, and there is no reason to separate one from the others. They are simply the columns on which to build improvement, and they should all cooperate with one another.

In practice, the system has a considerable degree of redundancy and thus of reliability. However, failures lead to inefficiencies in the ELI criteria – the more sensible of these include learning and integration. In extreme cases, typically caused by negative feedback loops, the entire improvement process could fail miserably.

In any company, the terms in Figure 1 are not thought of as point wise activities. The whole is a global process, developing in continuous time, although its effects would likely only manifest at random points of time (or events). However, those events have a lasting influence on behavior because every item is a name for a process occurring within the global process that is possibly running independently of other processes, i.e., according to its own dynamic. Obviously, inside every sub-process an entire pyramid of processes is operative, followed by additional pyramids and then more pyramids, ad nauseam.

Neojiba

The previous model, although reasonable, is difficult to test in a sensible way. Because it is a global process, the size of such an effort exceeds the normal span of a research project. To anchor it in real life, a simple case must be found in which the hypotheses are so obvious that they can be construed as axioms.

In trying to pin down a suitable case, we came across what we think is an excellent case that allows for a global analysis without being too complicated. In the past, we were interested in the project known as “El Sistema” in Venezuela, and after some initial efforts, we arrived at the conclusion that it was too unwieldy to be treated in depth¹³. While participating in a project a few years ago at Salvador de Bahia, we came into contact with Dr. Ricardo Castro, the head of the Neojiba project. We were allowed to accompany the orchestra during its 2014 European Tour. We lived for a few days as part of the orchestra, and we were able to interview musicians and managers with complete freedom. We were well accepted by the collective of musicians and managers, and we were fascinated by their approach to life. In the following, we briefly document the Neojiba project, referring the reader to the actual case.

¹³ “El Sistema” has more than 250 orchestras operating across Venezuela.

Neojiba is not a system of orchestras – as “El Sistema” is – but a social structure whose objectives extend beyond the purely musical. It was originally conceived of as a way to keep young people away from drugs and to prevent them from depending on income generated in the drug business. Inspired by the Venezuelan experience, it was thought that involving people in challenging and fun projects could provide the motivation required to fulfill its purpose.

The city of Salvador de Bahia is in particular need of such approaches. It is an underdeveloped Brazilian city in which drugs run rampant but is also a land of music and rhythm. Young people are obsessed with music; they live for and dream of music. Although it is primarily pop music with a strong and distinctly native flavor, the soil seemed ready to receive new seeds.

At the time, the challenge was to recruit young people to become players in a symphonic orchestra. The orchestra aimed to perform – at a professional level – the full repertoire of classical music, as would any other symphonic orchestra in the world, emphasizing the native virtues of the players. To maintain motivation, the training had to be undertaken rapidly, with no boring afternoons of scales, so that the results were tangibly enjoyable to friends and others.

Neojiba started seven years ago and has spread into two major orchestras and a number of musical training centers for the benefit of would-be players. The project has developed a special approach to musical learning that is geared to achieving its objectives. Although it initially followed the Venezuelan track and was initiated in cooperation with Jose Antonio Abreu, the founding father of the Venezuelan “El Sistema”, the founders of Neojiba have developed its own particular structure and training methodology.

The Research Plan

Our questions for our fieldwork consisted of the following:

- 1) Is the Neojiba approach to training and learning successful?
- 2) If so, what are the key ideas behind it?
- 3) Can it be exported to other areas of activity? Does it have any advantages?

To answer these questions, we performed the following:

- 1) We evaluated the success of Neojiba. This was a difficult endeavor because the whole idea is not clearly defined, and the very definition of success is difficult to measure. Notably, time data are scarce because the operation has been active for just a few years. Furthermore, “being good citizens” should be considered the primary criterion, according to the fundamental principle of Neojiba. In view of the foregoing, the technique we used here was to conduct interviews with approximately 40 musicians from the orchestra to inquire whether they were satisfied with their careers and why.
- 2) We constructed a model of Neojiba, the NM, which extends beyond the orchestral world but incorporates its key ideas. We began with the previously presented two-cycle model and extended beyond that model to incorporate additional variables, allowing for a more specific approach.

- 3) We extracted the ideas valid for all operations in the enterprise from the NM. We relate the previous observations to the literature and report what we think are the main traits of successful deployment.

Is Neojiba Successful?

The simplest way to evaluate a venture such as Neojiba is based on its artistic results, which is easy because it primarily involves listening to music instead of other convoluted approaches in use in other fields. We begin by reporting what we heard, i.e., the music performed by the orchestra, particularly the music performed during the European tournée of the orchestra in July 2014.

Of course, the authors are not music critics, or even music experts; instead, they are simply big fans. We will try to present the results in some detail because it is difficult to judge the overall quality of an orchestra. To be coherent, we will organize our comments based on the concerts played, indicating the repertoire in each.

The average player is approximately 25 years old.

Visual Appearance and Sound

At first sight, the YOBA orchestra (the most advanced of the Neojiba orchestras) is a group of approximately 125 musicians, similar to any large orchestra. Altogether, the feeling was of a large but compact group.

Its disposition on stage is the usual disposition for a symphonic orchestra, “au grand complet”. The musicians, of different ages and heights, were dressed formally in black. A blue tie was included in the men’s outfit, and the majority of the women wore low-cut dresses, which is also normal attire in a symphonic orchestra. All the normal rituals took place as the orchestra and its conductor entered the stage. In short, their disposition was professional.

As the orchestra plays, it is clear from the musician’s attitudes how much pleasure they derive from it. Smiles of approval are common, and the enthusiasm and energy is abundant. In the most popular pieces of music (symphonic sambas, for example), it appears that the musicians are restraining themselves from dancing to the music. Their presentation is friendly, happy and moderated by the character of the music; they can easily change their mood from happy to sad and back again, depending on the music being played. We even saw some musicians cry during a particularly moving moment of a performance.¹⁴

The orchestra has a large percussion section (11 instrumentalists) and a wide variety of these types of instruments. The percussionists continuously, and discreetly, change and prepare the tools of their trade. In the percussion concert, the group was magnificent on all standards.

The brass section is generally very good, with some hesitation in the trumpets, something that occurs in many good orchestras. The first trumpet is excellent and stands out from the rest. The

¹⁴ To see a performance, we recommend Youtube videos: Youth Orchestra of Bahia and Lang Lang – Tico-Tico no Fubá. To position the orchestra, it is best perhaps to watch the last piece played by the Berlin Philharmonic to see the differences in precision and enthusiasm.

section has a powerful sound that it sometimes does not completely control, leading to certain difficulties in playing pianissimos.

The woodwinds with an orchestra so large and powerful were a bit subdued and were sometimes difficult to hear behind the splendor of the brass.

Finally, there are many strings; there are at least 25 first violins and a proportional amount of second violins, violas, cellos and double basses. This last group is the smallest, with 8 players. As we said, the strings had a small clarity problem resulting from a certain lack of homogeneity, which likely makes it difficult to achieve outstanding results when playing Mozart or Haydn.

In general, the orchestra sounds very good. In the *forte* passages, it produces an intense and aggressive sound wave, which is necessary in romantic and post-romantic repertoires and music of the 20th century.

In conclusion, YABO is not a world-class orchestra, such as the Vienna Philharmonic or the New York Philharmonic. If we were to classify it next to other professional orchestras in the world, it would be roughly in the middle of the group, where many present Spanish orchestras belong. Having said that, it should be noted that the orchestra sometimes produces moments of catharsis in which it sounds exceptionally good. Nobody would believe that some of the players are only 14-years old!

The Montreux Concerts

Concert I.

Conductor: Ricardo Castro, with Colin Currie, percussion

1. Leonard Bernstein, *Symphonic Dances from West Side Story*. The orchestra was slightly anxious in this first piece, focusing too much on not making mistakes. As result, the piece sounded somewhat stressed and tentative.

2. Julia Wolf, *Rise and Fly, a body concert*. This was an exhibition of the percussion soloist, who used his own body as a percussion instrument. The orchestra had a secondary role, but it provided a suitable musical context so that Colin Currie could shine (and almost hurt himself, thanks to his own performance!).

3. George Gershwin. *Rhapsody in Blue*. This piece fit the orchestra like a glove. Brilliant and energetic, they performed a splendid version. The sound balance left something to be desired at certain points because of the aforementioned weakness of the woodwinds (which might have been partially have been due to the acoustics of the room). For the history, see the melodic *tutti* of the second part.

4. Heitor Villalobos. *Bachianas Brasileiras n° 4*. This was a good version of this piece with a lack of clarity in some passages, although it did not spoil the sound. Altogether, it was a well-resolved piece.

Overall, it was a good first concert, particularly the second part, which made us forget about the musicians and concentrate on the music.

Concert II.

Conductor: Ricardo Castro

Marta Argerich and Alexander Gurning, piano

1. Francis Poulenc. *Concert for two pianos and an orchestra in D minor*

How would the orchestra perform with 20th century music? It quickly became clear as the piece started. It was good and could not be any other way! The instrumentalists showed perfect agreement with the pianos and one another. The difficulties of the piece were nowhere to be heard, and the pianists were excellent. In fact, their performance slightly blurred the role of the orchestra.

2. Gustav Mahler. *Symphony number 1 in D minor, "Titan"*. In the second part, the orchestra played a piece from a large orchestra repertoire without losing combo. Moreover, it was one of the best versions of Mahler and "number one" that we had ever heard in a concert hall. The orchestra liberated itself from its anxiety and tentativeness and dedicated itself fully to playing the music. Oh, and did they! Man, if they did it! With splendid *tutti* but subtle nuances, the conductor and the piece extracted from the symphony everything it had to offer. The orchestra received a thunderous ovation from the audience, which was on its feet. The audience was captivated by the music, not by "those nice kids".

In the encores, we glimpsed how the orchestra might sound with its music. It played two symphonic sambas, "Tico-Tico no Fubà" and "Brasil". The orchestra bent over backwards to produce a stage-musical anthological version. The 125 players danced to the music as if they were a high school band while concurrently maintaining the quality of music. The percussionists had a field day. Once the formal concerto was over, the brass made their exit, crossing the room and playing popular music. Happiness and quality characterized this great concert, which was worthy of a very good orchestra.¹⁵

Our observations were completed by attending the rehearsals, which allowed us to see the hard work in real life and to exchange opinions with professional European musicians.

The Interviews

We interviewed a large portion of musicians in the orchestra in depth, i.e., 40 musicians selected with the cooperation of the conductors and educators. The interviews were largely exploratory and informal. We tried to learn what these musicians felt were the reasons behind Neojiba's results; in particular, we focused on the learning process and the resulting product. We then collected all scripts and extracted 20 key issues (using the Shohi Shiva version of the KJ method¹⁶) that were the critical structure of the learning process, as follows:

- 1) Excellence comes before everything.
- 2) Progressive people are selected with a clear statement of tangible physical targets.
- 3) Finalist teaching – what is required in the short term – is employed.

¹⁵ Since this concert, traditional symphonic orchestras have seemed to us to be a group of older people, mostly playing in a boring middle-class way. They may play much better than YABO but they seem much less enthusiastic.

¹⁶ An American TQM.

- 4) A professional reward system based on better working conditions and status is employed.
- 5) They teach to learn and learn to teach.
- 6) Stable monitors are in place for every participant, with a full view of the musician's performance.
- 7) Well-designed challenges are backed up by veterans providing "adequate theory".
- 8) Nobody will tell you what the problems are. You should discover them and their solutions.
- 9) We work as a group, with group methodologies that take priority over individual ones. (We all work together!)
- 10) Everything is ingrained in the group; the solutions to problems are for the group.
- 11) Success belongs to the group and is perceived immediately.
- 12) Everything is shared (although there may be some individual considerations).
- 13) Music, knowledge, affection and friendship are to be shared with everyone.
- 14) We work with people, not with musicians.
- 15) Variety among people is a driver for learning.
- 16) Diversity is a generator of challenges.
- 17) Errors are buffered before they occur and adjusted relative to their importance.
- 18) Different repertoires are put together in a consolidated repertoire.
- 19) Everything should be performed in a professional way.
- 20) Living in common is creative and should be exploited.

The above observations were judged as too detailed for a global approach. Accordingly, they were processed by the researchers, using the same KJ method, and became the subject of in-depth discussions with some of the Neojiba people, particularly the musicians. As a result, we identified the following set of four global factors that were considered the main drivers of the learning process in Neojiba. We call them the "Neojiba Engine" because we believe they are the key factors that make Neojiba work:

1. No bosses, but facilitators
2. Learning and mentoring by task switching
3. Finalistic Learning
4. Recurrent improvement by "increased operators"

In the following table, we compare the above four global factors with the rules presented in Spear and Bowen (19) for TPS.

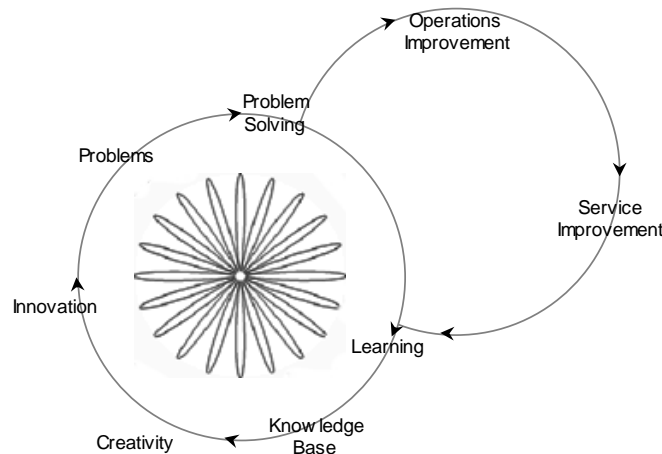
Neojiba	Spear and Bowen (Decoding ADN of TPS)
No bosses but facilitators. There is no need to give orders. Instead, define objectives at all levels and provide help in fulfilling them.	Any improvement must be made in accordance with the scientific method, under the guidance of a teacher, at the lowest possible level in the organization.
Learning by mentoring and task switching. Use the task structure of the processes to create learning opportunities.	<i>(No direct correspondence)</i>
Finalistic learning. Learning from immediate task problems. Learn by achieving short-term objectives.	All work should be highly specified as to content, sequence, timing, and outcome.
Recurrent improvement by “increase operators”, provided by the organization to achieve improvement.	Every customer-supplier connection must be direct, and there must be an unambiguous yes-or-no way to send requests and receive responses.
<i>(No direct correspondence)</i>	The pathway for every product and service must be simple and direct.

As shown above, although the spirit is largely the same, there are important differences. The ADN properties have a strong industry flavor, whereas the Neojiba properties reveal their source in services. The simple nature of the YOBA service – simple by reference to industry standard activities – allows for a better view of the insides of the operations. This simplicity makes focusing on global ideas more transparent just by comparing the level required to derive concrete proposals for action in both columns.

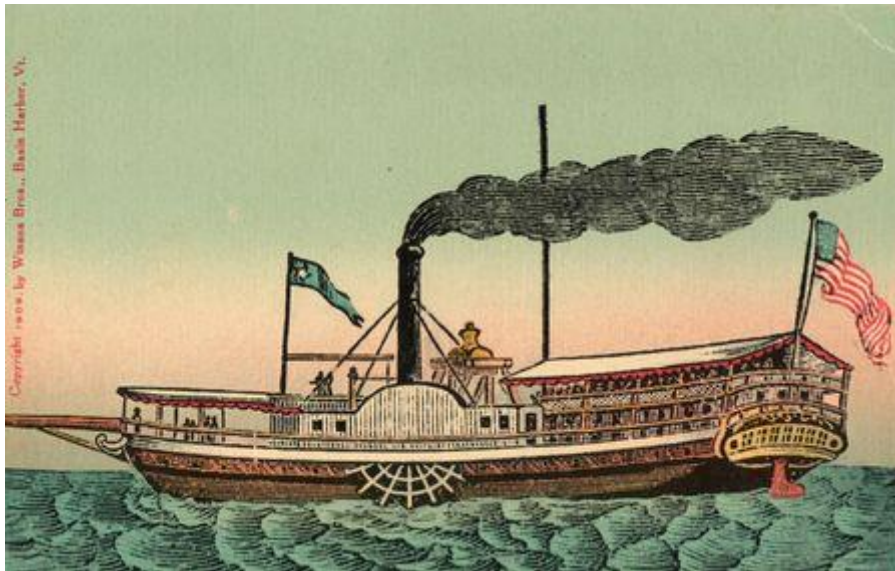
From this point forward, we concentrate exclusively on Neojiba factors. In the four Neojiba factors, the relevant parts can be identified that (logically) seem to explain the effect of the factor. Let us reveal them as we explore the model.

The Steamboat Model: An Improved Model of the Neojiba Learning Process

Building on the structure of the two-cycle approach, we present a simple modification of it in the picture below. We begin with the two-cycle concept, and we identify its main drivers by employing the previous 20 Neojiba properties. Notably, in the two-cycle model, we did not consider the action types that build each variable in each loop, particularly in the internal loop, the results of which are directly controlled by the company. Now, we must descend one echelon in abstraction and use the previous results that are the foundation of improvement.



The floral-like arrangement inside the inner circle is analogous to an old-style steamboat. We must design the palettes pushing the boat. Their effect basically occurs in the inner circle. We identify the 20 palettes, which are the 20 key issues collected through the interviews with Neojiba's musicians. The steam engine is, in turn, represented by the driving forces behind the aggregates of the palettes, the forces that push it forward. In turn, those aggregates correspond to the four global factors that we have identified in the engine of Neojiba and that are responsible for its success.



The Steamboat Neojiba Model

Driven by the engine, the palettes keep turning, brushing the *cycle variables* in various degrees, based on the type of palette. This analogy highlights the importance of not restricting the effect of a palette to a single cycle-variable. Additionally, there is no one-to-one relationship between the effect of the palettes and the development of the four key factors in the engine. Providing steam turns the wheel that acts on the cycle variables. Not all cycle variables are created equal; the main ones are creativity, innovation, problems and problem solving. It might be argued that once these four are committed to, the workings of the rest of the cycle variables are autonomous – they run by themselves with little or no surveillance.

A Look at the “Engine According To Neojiba”: Its Four Key Factors

In this section, we briefly discuss each of the four factors in the engine, and we briefly describe the Neojiba approach to exploit the steam generated by each factor.

1. *No bosses, but facilitators.* It is common knowledge that symphonic orchestras are a nest of conflicts. Rivalries, prima donna complexes and related anomalies sometimes combine to create permanent conflict. Imagine now the Neojiba Orchestra. You can play there for only a limited amount of time and not after age 30. What would you do beyond that age? In the dynamics of a normal orchestra, conflict is likely already served, which would lead to the death of the full project. There may be many alternatives, but that chosen is both drastic and efficient. There are no bosses. Nobody has a local niche of authority. Nobody tells anybody else what to do. You are

supposed to do it. You allow for mistakes. Error is human. Thus, there is never resentment or bad faith. We work together, play together, and live together. We depend on one another through our work. Otherwise, people would not belong and would be excluded.

How do you manage the unity of purpose? You establish a set of objectives and create the path to achieve them. Everybody will see your performance. When we play in a concert hall, everybody sees and listens to everything you do, including your fellow musicians. Therefore, the answer is simple. Propose a network of related objectives to musicians and then *trust them* to do their best in achieving them. If they do not succeed, they fail, and the collective will not tolerate such persistent behavior. The failure could be a matter of technique, a failure in the selection process, or a lack of desire to perform. In each case, if you fail, we fail, and your success is our success. If we fail, we will be discredited, and down the drain goes all our hard work. The critics will say, “The orchestra has not improved; it is the same as last year”, and all interest will eventually disappear. In such situations, the group will create a culture that excludes failures by misbehavior – and apparently, it does!

In summary, what you must do is insist on ideas and provide the tools to accomplish them. Buy the musicians a violin (if they need a new one), provide good copies of the scores, and so on. Then, the control mechanism will take over in automatic mode and achieve internal unity.

In a sense, all we are saying is the following: “Show that you care for the musicians and for everybody else. You are not the boss; you are a simply a facilitator”.

2. Learning by mentoring and task switching. One of the problems with putting the model to work is controlling the manner and rate of problem generation. If there are too few problems, there is no learning. If there are too many problems, and the universe becomes noisy, solving problems becomes complicated because of the lack of competition, and the rate of problem solving diminishes. We know that problems represent challenges, i.e., the challenge of being able to solve them. How do you control this rate, which is a critical variable in the speed of learning? In industrial operations, there is a substantial rate of autonomous problem creation because of the interaction with the market (or, more generally, with the environment). This is not the case in Neojiba where they implement a system of controlled challenge creation. Challenges are easy to define in Neojiba: They are fragments of music that is somewhat above – but not too far above – the student’s expertise of the student. Thus, the experience becomes frustrating, and there is no learning (de Treville, as quoted in 15); it is not below their expertise because then the problem is trivial (and again there is no learning).

The answer from this perspective is obvious: Create a process of challenge generation tailor made to each student, which is undertaken with a body of monitors (or teachers). Due to the nature of the situation, there is a simple way to create the right challenge that does not take too much time: Select fragments from libraries of musical fragments that are available on the internet, in order of difficulty, and keep track of where the musicians are. This process is efficient. Once the assignment is performed, there is a need to control whether the student is successful in it. Therefore, monitors become coaches by giving advice regarding how to solve the problem. The essence of the situation avoids one of the biggest mistakes that even professional teachers make in which the monitor ends up solving the problem for the student! That does not occur here. Music learning requires the learners to sit in the driver’s seat! You cannot play the piano by being given lectures on how to play piano, or on the physics of vibrating strings. You must press the actual keys!

A second – and important – way is task switching. Imagine the effect on a student of being invited to lead the orchestra in a rehearsal. This is an extreme case, but you can have the same results by carefully grading the assigned types of music. For instance, do not restrict the orchestra or the student to playing a single type of music¹⁷

3. *Finalistic Learning*. In Neojiba, you are *learning to play a part in the next concert*, be it at a school PTA event or at a large concert hall. Typically, when this occurs, you have spent 3 hours every day for 2-3 months rehearsing alone or in a group. Thus, learning the music is not “just in case”; it is “just in time”. If you are not going to need a given key signature, no effort should be put into practicing it.

There are no standard courses for all students. All coursework is managed on a *need to know* basis, so there is no academic curriculum as such. The operational nature of what is learned makes the approach easier. In common individualist learning, a high level of interaction should occur between the student and the monitor (the teacher), which is not true in operational knowledge. There is no need to explain in detail a group of ideas that must be absorbed. A few basic ideas are involved in music playing; it is primarily a guided trial-and-error approach that is put into practice, helped by a considerable number of heuristics. For instance, a flutist should learn the different embouchures required to play the full flute range. However, teacher involvement is essentially demonstrating the position of the lips and the mechanics of breathing and correcting the student. It is up to the student to become excellent, including adjusting to his physical structure and aiming toward the desired production of music, which is the ultimate test of the training.

If students can perform the playing required, they are okay. If not, they should keep practicing, which requires time, and the concert might be next week. Simple. If in a concert, a part has a difficult fragment, someone who does not have the required skills is advised not to play – or to play a simplified version – the fragment, subject to obvious constraints, and to keep up with the professionalism of the orchestra.

No grades are awarded to students, nor are there exams. Evaluations are based on the feeling that the participant is “doing well” from all his listeners (including colleagues). The only place in which evaluations are made formally is when there is a contest for entering one of the two big, more professional, orchestras. In this case, the candidate is evaluated on his/her past career at Neojiba by the evaluating committee. If the committee agrees, he is promoted, and his pay is moderately increased. The pay is modest but, at Salvador prices, a raise can make a substantial difference in the quality of life.

4. *Recurrent improvement by “increased operators”*. As in any system of decentralized decision making, a conflict appears between more advanced people – those with a better formation, perhaps veterans in their last years in Neojiba – and beginners (or at least less advanced students). Teachers (coaches) suggest alternatives and provide basic ideas for solving problems, but they must rely on their intuition and creativity. Some type of mechanism is required that allows people to improve by themselves but provides an increasingly advanced basis on which to proceed.

¹⁷ One of the authors learned to hate Bach (yes! Johan Sebastian!) when he/she was 14 years old. His/her sister, at the time a piano student, was forced (by his/her teachers) to spend two years playing just Bach “Study for piano solo”. The story has a happy ending because he/she is now a most fervent admirer of the old master!

This mechanism should not be a blocking mechanism, such as the approach to systems development employed in many companies. First, a company buys an expensive piece of software (e.g., an ERP). Then, possibly relying on users¹⁸, they design and implement the system, aiming at integration. Now, any changes, even small, become expensive, such that they are forbidden for efficiency reasons. However, the catch is that nothing stays the same in business; everything changes quickly¹⁹. Thus, after a year of operation, the system might already be obsolete, except in its more immutable parts, such as accounting, finance, statistics, and low-level data gathering.

Can you achieve continuous improvement using such processes? Doing so is difficult and expensive. We know of companies that have informally developed parallel unofficial Excel systems using only the ERP database. It can be done if an orderly plan of updates is scheduled. In the case of ERP, it should probably be a team effort. In many other cases, it might just be a simple indication that “you can change the order point of the inventory on Monday afternoon, and on Saturday, you will have the results of your past week and the decisions of your supply chain colleagues”. This method allows for splitting the continuous improvement and allows a higher degree of coordination between decision makers.

Not much innovation has occurred in symphonic orchestras in the last century²⁰. However, the essence of YOBA is learning, which means improvement. Some activities should remain immutable, but most are not, and even the immutable activities invite change. Therefore, a preliminary conclusion is as follows: *Neojiba does not need to redesign music-related processes. It should design and put into the hands of the user a metaprocess for redesigning simple processes.* In an orchestra, it is easy to experiment with because it is relatively inexpensive.

In Neojiba, the main sources of monitoring are as follows (in order): the mentors of the small groups, the responsible territorial ensembles and the conductors of the two large orchestras. However, above all, it comes from colleagues. In Neojiba, everybody is encouraged to express their opinion freely about the defects observed in their musical performances, which is accomplished by involving everybody in teaching. All students in Neojiba teach and learn from their colleagues. Therefore, the mentor is somebody that has superior authority and knowledge in some field of knowledge or expertise and is therefore a teacher who deserves credit and respect. If you are a drum player, and you know how to beat the drum, then you ought to show your colleagues how to do it. You become a teacher in drum beating. *Learning is teaching, and teaching*

¹⁸ Many times, it is not undertaken in that manner. Users are typically asked what would they like and how they want to use it, but then, some “process designer” (typically a consulting company) builds the “to be” process. Then comes the freezing. They program and implement the process, integrated with many others. (Systems should be integrated, they say!) The system becomes frozen because implementing any changes requires tampering with the full system. It is well known that in a consistent system, any inconsistencies propagate consistently until they reach the system’s boundaries (or even exceed them!).

¹⁹ How about the Bric’s evolution in less than ten years?

²⁰ Likely what has been affected more by innovation are instruments. A network of flutiers surrounds any large orchestra and keeps introducing changes into instruments, careful not to destroy their relationships with the rest of the orchestra. Leaving aside electronic instruments, one of the more revolutionary innovations in instrument design is the flute. Theobald Boehm, from 1832 to 1845, devoted his energy to redesigning the flute according to scientific principles. The result is the modern flute, which is played in most orchestras, although some players nonetheless prefer the more mellow sound of the pre-Boehm flutes.

is learning. Nobody scores you. If you do not learn, you will not teach, so everybody will know your lack of skill.

Therefore, you can improve by collecting increase-operators, recipes, and algorithms but most likely by improving heuristics, and you can put together your own version of an improvement heuristic, which will not be lost because one day, you will be teaching drum beating, if you keep improving.

In general, the entire system has a type of double-loop behavior. It is not what you do that changes the system state. Instead, what you do changes the way in which further actions change the state. That is, it recursively changes the way somebody changes the state.

Nonetheless, the meta-process should be formalized. This formalized process should be iterative such that any reasonable musician can go through it on his own initiative to achieve results independent of his experience in the musical art. How to do it is not yet clear and should be the subject of further research.

In any case, the message should be “Rules are meant to be broken. Do not make them too impossible to break”.

Conclusion and Lessons for Companies

The main contribution made by the Neojiba experience to general business practice is related to a new and more systematic approach to quality that includes all aspects of the operations system. The task of continuous improvement is indeed complex and made even more complex when it is not considered the main line of business activity. Many companies address quality almost as an afterthought.

Typically, improvement is defined as an increase in certain indicators (in many cases related only to the financial side of the company, unfortunately) but in a wide spectrum of areas. This definition may be appropriate but is *a result and not the cause* because “the cause” is to be found behind the actions changing the structure and the parameters of the operations system.

In trying to categorize the causes, our NM considers a comprehensive spectrum of quality variables, covering four subsystems:

- a. The ELI, which measures the results and objectives of the improvement;
- b. The Neojiba engine and its key factors;
- c. The palette, with its 20 individual components; and
- d. The internal cycle variables, excited by the movement of the palettes.

Once you have a general model, the implementation plan requires collecting ideas – most of perhaps well known – and putting them aboard the steamboat. The boat is where the work is performed, where all the bits and pieces are gathered, and where a purposeful structure is created. Presenting a full implementation of the model will be the subject of a future paper.

However, the reader can gain partial insight by looking at (15 and 16). Reference (15) primarily addresses the knowledge approach. Specifically, b and d can be linked at least partially with knowledge and its management, and (16) analyzes the icosalog, a set of 20 action lines related to the palettes, although it emphasizes their operational side. It also contains a number of hints to implement c.

Finally, in terms of more detailed actions, such as (17), most of the work on TPS suggests many concrete ideas for implementation, which must find their cooperative role in models such as the model presented herein.

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