

Educating - power

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ABSTRACT: The concept of power is familiar to mechanical and electrical engineers by its relevance to their work, but may only register in the minds of civil engineers as something they met in their physics subject, way back in their undergraduate days. Having dealt with the three older and more easily recognised sub-disciplines, one may wonder how the many new varieties of engineering regard power, but that question can be disregarded here; it is sufficient to consider the understanding of the first two who use it extensively. So, mechanical and electrical engineers learn about power as a factor in machine operation. What they do not learn, but experience as they move into the workforce, is another type of power, the ability some people have to exert influence to control the behaviour of others – including the typical graduate engineer, who may acquire an increasing level of this form of power if he/she progresses through an organisational hierarchy. In this article, the author, by providing a background and introduction, briefly reviews power in the engineering context, then covers in detail the nature of organisational power and why junior engineers, even undergraduates, should learn the basics before being exposed to it.

INTRODUCTION

As this article is for an engineering education journal, the author begins by reviewing the concept of power in engineering terms: it is the time rate of carrying out work, or the rate at which a machine is capable of doing work. This is fairly new, probably only 200-300 years old, perhaps only a little while before horsepower was named as the unit of power. The metric power units followed later, as did the relationship between physical power and thermal power. All that is important as it relates to the machines that help civilisation to function.

Mathematically, power may be expressed as dW/dt , therefore an *input* to human endeavours from some source. But that input must come from some output, and the same units and expression are used to measure or indicate the power provided by a source as the power expended undertaking the work to which the input power is assigned. This, essentially, relates to the first law of thermodynamics.

Between power supply input and output use, unfortunately, another law of nature, the second law of thermodynamics, comes into play, and forces one to accept that one can never get out (as work) as much as is put in (power supplied).

Do those reflections have any connection with the *other type of power* to be discussed? It shall be seen.

ORGANISATIONAL POWER

Organisational power does not respond to mathematical laws as does the other form, it can be applied in an infinite number of variations from gentle to extremely heavy, and affects proportionally those on whom it is exerted. It can also affect those who use it. The most extreme form of this type of power was summed up by Lord Acton: *Power corrupts, and absolute power corrupts absolutely* [1].

As an illustration of the result of *absolute (and addictive) power*, consider Macbeth, told by the witches that he would be king. Once settled on the throne, he became what Whitney and Packer have described as a *serial killer*, wiping out opposition and competition, with *Shakespeare showing us the most dangerous temptation of power; namely, that we think it is a good in itself. Might is right* [2].

This article has opened with the above to present, from the beginning, the point that organisational, or management, or imposed-on-people, power is like nitro-glycerine: it must be handled with care; if handled badly, the results can be catastrophic.

A DEFINITION

It is time for a definition. What is this power, to which the above cautionary emphasis has been attached? From an early reference on the topic, there is the following:

Power is a measure of a person's potential to get others to do what he or she wants them to do, as well as to avoid being forced by others to do what he or she (the person) does not want to do [3].

(The reverse italics and the two words in parentheses in that quoted paragraph have been added).

Another reference sums it up more succinctly: *Power is the ability to exert influence* [4]. The brevity of that definition begs a sub-definition: *We will define influence as actions or examples that, either directly or indirectly, cause a change in behaviour or attitude of another person or group* [4].

As a final summing up, there is a lengthy explanation by Pfeffer, using material from several sources:

... power is the capability of one social actor to overcome resistance in achieving a desired objective or result. ... a relation between social actors in which one social actor, A, can get another social actor, B, to do something that B would not otherwise have done. Power becomes defined as force, and more specifically, force sufficient to change the probability of B's behaviour from what it would have been in the absence of the application of the force [5].

A final word, here, by Pfeffer explains the problem with defining power: *Power may be tricky to define, but it is not difficult to recognise*: the ability of those who possess power to bring about the outcomes they desire [5].

As noted above, some writers say it is the *ability* to influence, but this author feels that word, *ability*, is not quite right, being *able* to use power does not influence others, influencing others only occurs when power is *used*. His point in that last quoted paragraph is rather like the answer given when a person is questioned about preferences in any form of art (literature, drama, painting, sculpture), the answer is: *I do not know anything about it, but I know what I like*. Similarly, organisational or management power is known when observed, directly by experience or as a third party.

For many writers (Kotter [3] is an example), the idea of personal power, held and exerted by one person, is something about which most people in society seem to feel quite uncomfortable. This is probably due to a general perception of what can happen when power has been exercised by one person over a group of people, as shown by exceptional cases in recent history and as noted by Lord Acton. Nevertheless, it exists and is used, and it can be used in quite reasonable and beneficial ways, in business and industry, and must be recognised as one of the forces that make a formal organisation operate.

So, power is the means of influencing the behaviour of others, it is the intangible tool or device by which the behaviour of others is influenced and controlled.

TYPES OF POWER

Although the precise nature of power may not be easily defined, many writers have given descriptions of sub-types, for example, from DuBrin, as follows:

- Legitimate power is the authentic right of a leader to make certain types of requests;
- Reward power is a leader's control over rewards of value to the group members;
- Coercive power is a leader's control over punishments;
- Expert power derives from a leader's job-related knowledge, specialised skills or talent, as perceived by group members;
- Referent power refers to the ability to control (group members) based on loyalty to the leader and the group members' desire to please the leader;
- Subordinate power is any type of power (or force) that employees can exert upward in an organisation, based on justice and legal considerations [6].

It is rather curious that the above, and much more on this topic, has been placed under *leadership*. A very similar list appears in many other management texts, such as Stoner et al [4].

The very best reference on power, how to gain it, retain it and use it, comes from a writer now dead by several centuries, Niccolo Machiavelli [7]. Although written in a political context, its precepts can be translated into management terms, which has been undertaken by Jay [8]. Another writer, Greene, has taken Machiavelli's concepts with those of Sun-Tzu, Clausewitz, Bismark, Tellyrand and others, has itemised them, and set them out in a handbook instructing his readers how to play the power game successfully [9].

INFLUENCE METHODS

Looking back to the succinct definition by Stoner et al, we find the word *influence* [4]. Thinking of that, it can be concluded that a *social actor*, to use Pfeffer's term for those involved in action, may have one of the forms of power noted above, and uses it to influence the other social actors around him/her. How is that influence exerted? Power may be a strategic device, but it needs appropriate tactics in order to make it influence others. Such tactics are given by DuBrin, as follows:

- By example – the leading actor serves as a positive model of desirable behaviour;
- Assertiveness – being forthright with demands, no metaphors, straight talking;
- Rationality – appealing to reason and logic;
- Ingratiation – getting the person to be influenced to like the power person;
- Exchange – offering to do something if the person to be influenced does what is required;
- Coalition formation – acquiring a supporting group with common aims to increase influence;
- Joking and kidding – persuasion, used to soften instructions that might offend [6].

The selection of the method to suit a particular situation depends upon many variables that are related to the social actors involved, others who may be peripherally involved, the situation itself, and others, too many to cover here.

Actually, it is much easier to say *what can be done with it* than to say *what it is*, in itself. The presence of power, the influence action, in one person, over others, is indicated by – and may be measured by – the outcomes, such as the rewards and punishments given to others. Power provides the means to promise, give, threaten to withdraw, as well as even withdraw rewards, and to threaten and actually carry out punishment. The rewards, and any punishment, may be physical, mental or emotional – any of these are effective in different ways under different circumstances.

SOURCES OF POWER

It is also relatively easy to identify what are the sources of power in the organisational sense. The most obvious one is the position in the organisational hierarchy, because position, and the related access to organisational resources, definitely put someone in a power-position.

Power *may* be purely subjective, ie a bluff or a con. Indeed, the author has concluded that in almost all cases of the use of power (particularly by an individual), there is an element of bluffing or conning, and the proportion of the bluff component in the application of power depends on how much backing-up is known to be available from the organisation surrounding the

person exerting the power. The ultimate form of this power is what is exerted by a charismatic leader; such a person depends entirely on a feature of personality, or on an appeal to some internal desire or need within the followers.

This is because power is generally exercised *downward*. However, because the freedom to use it is granted from *above*, in most cases it depends on support from those levels *above* the person exercising it. If that support is withdrawn, the particular power-person being considered may be destroyed because he/she can no longer exert the power he/she had. The obvious exception to that is the power exerted by *the man at the top*, who has no-one higher as back-up; he/she depends on support from the next level *down*, and if that support is removed, then that person at the top is removed (remember Bob Hawke? And Margaret Thatcher? And Richard Nixon? They lost their positions when their underlings withdrew support). If one thinks about cases like that from history, one can see that the person at the top is not only in a lonely position, but also in one that is quite precarious.

However, power-in-a-person stems not only from an organisational position, but also from individual factors like physical size or strength (and the quality known as *presence*), command of economic resources (to some extent *knowledge* can be included here as a resource: for example, the information held by a blackmailer provides power), above average performance in a specialised field, or ideological persuasiveness. In many cases, these factors will be found to overlap or reinforce each other.

There are physical indicators of power, used *extensively* by humans to overcome any resistance coming from those below in an organisation. The most obvious examples come from the military; officers get better uniforms with all sorts of badges to show that they *are* officers. In the environment of management, and of business generally, the size and location of the office, the size of the desk and the material from which it is made, the type of chair behind the desk and the nameplate on the door (even whether one *gets* a door on the office) are all physical indicators of a person's position and of how much power he/she has. Having a secretary or personal assistant, particularly in these days, is also a significant indicator of power.

A PERSONAL OBSERVATION OF AN INDICATOR

Years ago, the author worked with a now-erstwhile friend, the project manager of the firm, who had an office in the *proper* office building, nicely fitted out and close to the higher people in management. All those trappings gave him that *power environment*. Contrawise, the author, ranked as an engineering manager, had an office in the building that housed the maintenance workshop, well away from the *power environment* and, therefore, unable to tap into the *executive power elite*. The location gave the author power within his own department, but little connection with other managers.

OTHER COMMENTARIES

Hunt has made the point that:

Power is created by members' acceptance of any program for behaviour – whether acceptance of the program is seen as a concession to a power figure, as unconscious norm construction, as social

suggestibility or merely as conformism because of fear of reprisal [10].

That is, it is the *acceptance* of what is imposed that shows the presence of power, not what the power-figure does to cause the imposing.

Hunt also quoted seven hypotheses by Gellerman, the first of which tends to follow Lord Acton's dictum: *Anyone who possesses power tends to use it to satisfy his own motives* [10].

De Vries, in his usual quaint manner, has stressed the difficulty of defining power by listing:

... economists, sociologists, political scientists, psychologists, and anthropologists alike each one of whom – depending on his particular orientation – is apparently engaged in the pursuit of a different animal [11].

He summarised the bases of power as simply control over physical, material and symbolic resources. He developed from these power styles a model of power based on three dimensions, which are *not mutually exclusive but can occur concurrently with varying degrees of intensity*.

An interesting view of influence comes from Eppler: *In a management sense, [influence] is the ability to secure a desired outcome without the apparent use of force or direct command* [12].

Mukhi et al summed up the need for power, influence and their use, as follows:

The work of organisations is carried out in a setting of power and influence. Multiple powerholders with diverse forms of, or claims to, power interact. The manager's job is to read these realities correctly and marshal sufficient power to influence achievement of organisational objectives [13].

AUTHORITY

Legitimate power is the *niciest* form of power, it is a formal recognition by some social actors that certain others can control their actions and behaviour. This is the form of power needed by managers to perform their duties.

Pettinger has quoted Weber as having defined three categories of authority, namely:

- *Charismatic*: from a special aspect of a leader's personality, such as from J.F. Kennedy;
- *Traditional*: from kinship as a basis for allocating power, such as a son following his father;
- *Legal-rational*: following from accepted rules and norms, occurring in all formalised hierarchical organisations [14].

However, for a fully-successful exercising of this form of power in a work situation, which is filled with a relatively large proportion of *experts* and *specialists*, it must be backed up by something else. That *something else* is what is defined as *authority*, given to those who move into management positions by someone above the appointee.

To illustrate this, take the lack of that characteristic. When it is missing, an interesting situation occurs when the manager tries

to exercise some power *on* those people who work for him/her, because the *acceptance* of his/her power by those people depends upon being recognised as *an authority* by those people on the particular matter he/she manages. If they do not experience that act of recognition, based on their knowing he/she has been given *authority*, he/she will be unable to influence them as he/she wishes. Instead, they will find all sorts of ways of doing what they want, which *may* in some respects agree with what the organisation wants. But, equally, it *may not*.

So, *authority* is the characteristic that engenders acceptance by others that the power held and used by someone is *legitimate*. The use of authority backed by expert power is what a person uses to get others to do something, by knowing *what* to do and *how* to do it. An apt illustration of this is contained in the phrase: *He is an authority on ...*, which can be translated as: *He knows what he is doing when ...*

There is a very real difficulty with this word (authority) because of its meaning in common usage, particularly for engineers. One hears of certain government departments being *statutory authorities* and, just to make it more confusing, some of these *authorities* have certain *powers*. In this context, *authority* has a distinctly different meaning (much closer to *power*, which is what those departments have), and it must not be mixed up with the meaning given to the word here in the organisational context.

To be ranked as an authority (for an individual to be recognised as being an authority) may, therefore, be earned by the demonstration of knowledge. This acknowledgement of someone being an authority is quite subjective, and should be from both directions – from above in the organisation and from below – if it is to work.

SOME COMMENTS ON AUTHORITY

The reasons why the people below someone in an organisation will see that someone as *having authority* may be for a variety of reasons, from the position the person holds, such as the actual position (but recognition from below in that case may be terminated if the *authority-figure* does not make a good showing), rank (which applies particularly in military organisations), tradition (as in patriarchal societies), or to a fundamental belief in personal qualities (particularly what is called *charisma*).

The reason why those above someone will grant the appearance of formally-recognised authority is because that act of granting authority is an important manifestation of power granted (also) from further above, in the organisational structure.

Power, and authority, may shift as time passes after a power-figure is given authority. Generally speaking, there can be a period of instability while an organisation is in the process of being established and, during that period, a power-figure will be in control. But when an organisational equilibrium is reached, the power-figure *may* (quite often *does*) become *remote* from the group being controlled, an authority-figure may *float to the surface* from within the group and *assume* control.

Remote, here, does not mean, necessarily, remote in a geographical sense, but less available to those in the lower

layers of the organisation, for example less often seen in the factory, spending more time in his own office, or lurching out with the next-one-up, during which time work flows on as it always has been organised with the authority-figure controlling.

The distinction between these two forms of control can be explained as follows: the first individual, the power-figure, either seized control or was appointed by some higher power, but the second, the authority-figure, emerged from within the group (*one of the gang*) and was able to take control with the consent of the members. *In time*, if this goes on, the power-figure often does become even more remote from the group (for example, quite often by wishing to associate more with his superiors instead of with the *proletariat* below him/her). If that occurs, then the authority-figure has the opportunity and may be able, in effect, to take a much stronger part in the control of the group than the power-figure (who would not be aware of this trend, having, by this time, become too remote to know of the trend occurring).

ANOTHER PERSONAL OBSERVATION

The best and most complete example this author can give of such a power redistribution was the appointment of a new production superintendent over a very tight-knit group of shift foremen in a machine-operating factory. In the original *official* structure, the foremen reported direct to the factory manager, with no-one in between, although in most of the other production units in the company, a production superintendent occupied a position between the factory manager and the production foremen.

However, as the factory manager had become somewhat distant from them, the foremen had formed their own group, with one foreman accepted as the *senior* one who sorted out everything. The factory manager had become *remote* from the group, which then tended to operate as it saw fit under the senior foreman who, as the original *authority figure*, had become the *unofficial power figure*. Although the senior foreman was shifted out of production to other duties, as warehouse foreman, he was still seen as the authority/power figure by the other foremen, who still referred to him any questions about operations.

The higher levels of management decided it was time to appoint a production superintendent. The senior foreman (this was obvious afterwards, if not before) believed he should be appointed to that position, although he lacked tertiary education, which was a normal requirement for such a position in the company. However, a person within the company – but external to that factory – was selected.

All this left an uneasy and incomplete *power vacuum*, which the new production superintendent had to fill. Of course, he was given *handed-down power*. But to fill the vacuum and exercise that power, he had to break into the group, somehow depose the internal authority/power-figure, and take control by becoming recognised as an authority, as well as the new power-figure. An essential step in becoming *an authority* was learning the process trade secrets, which were jealously guarded by the production foremen (who had learned them by having been machine operators) and (naturally) by the senior foreman. The efforts made by the new production superintendent to learn those secrets had an extremely disturbing effect on all the individuals involved, and on the organisation as a whole.

The bottom-line connection between power and authority is that successful management will only occur if the two are provided together, in concert and in balance. So what follows from power and influence, and authority? The answer: two more important features of management.

RESPONSIBILITY

This section is taken generally from Stoner et al, in which responsibility is defined as the *obligation to do* something, a duty to contribute performance for the benefit of the organisation [4]. Everyone in an organisation has such a duty in some form or other, and it is generally understood that there is no other reason for membership of an organisation than to assume some such responsibility. Whether the actual performance occurs is another matter, and comes into the item under the next heading.

Looking at this quality or feature from the psychological viewpoint, responsibility is created *within* a person when he/she *accepts* the duties or assignment within the organisation, that is, it is a personal phenomenon. It is not transferred to the person when a task, duty or assignment is delegated to him/her by a superior, because *responsibility* cannot be delegated in the same way as the actual work, duties, tasks and even authority can be.

This is so from both points of view. The person who accepts a task does not automatically *absorb* the responsibility for it with the task information, and equally the person who hands on the task is not *relieved* of the responsibility by having *delegated* the task to someone. The person at the higher level in the hierarchy *retains* the responsibility for what the person at the lower level will be doing. It would be fair to say the responsibility for what the lower person does is *shared* with the higher person, but that is splitting hairs. Responsibility always heads upwards, even though *whoever did it* (at a lower level) may *feel* personally responsible.

So here is one of the greatest problems of delegation. It does not make the manager's workload any lighter; every time he/she delegates something, he/she may unload the actual task performance, but retains the responsibility for that performance, for both the work itself and for the person performing the work.

ACCOUNTABILITY

Accountability is a feature irrevocably attached to responsibility. It simply spells out that a subordinate must answer to his/her manager, that is, be accountable, for the results of the power and authority used by him/her. Like responsibility, it cannot be reduced by delegation and, like responsibility, it is passed upward along the line: the person at the top carries accountability for the actions of every person in the organisation.

It should be obvious that responsibility and accountability go hand in hand, just as legitimate power and authority do. If a person is given responsibility for a certain output or result, the accountability follows automatically.

Similarly, all four of these factors are tied together. When a manager is given power to perform certain duties, he/she needs the associated authority, he/she should accept the related responsibility and then become burdened with the immediate accountability for his/her actions (and those working for him/her).

There are two *exceptions* to those rules. First, looking around managers under whom one and one's associates have worked, and it is not necessary to have decades of experience to see these phenomena, one can identify those managers who accept responsibility but try (and many succeed in this) to avoid accepting the related accountability, usually by foisting it on some subordinate. Second, similarly, one can pinpoint those managers who accept power-positions, but are unable to become authority-figures; they usually become objects of scorn to subordinates who know more than they do.

However, the rules of the game are as stated; these features go together in pairs, then as a quadruplicate, and dodging one of the pair does not deny its existence. Such an action by a manager only creates instability in the organisation.

For example, the author could name at least two managers, from his own past in management positions, who tried to retain a large measure of power (which was easy for them) and authority (which, lacking specialised knowledge, they could not), while giving him the other two factors. He believes his reaction to this was typical of anyone's in such a position: he was always unsure how to respond to others around him because, although he knew in many cases what should be carried out, he hesitated, lacking confidence that he would be supported by the manager above him.

A PARADOXICAL OBSERVATION

This present author is not sure whether he is quoting someone or whether this is an original thought, but he believes this is true (and he *thinks* it is original):

People who are dominantly individuals (successful as a one-man-band) tend to maximise their power and authority, and minimise their responsibility and accountability when put into management positions.

People who are dominantly managers, that is, conscious delegators, tend to minimise their power and authority, and maximise their responsibility and accountability when put into management positions.

(This author had no idea, when he first wrote this in autumn 1987, whether there is any psychological-type test which can determine these characteristics, but he suspects there must be, even though none have found). From the above, it seems to the author that the extent to which a person acts effectively as a manager depends on how well the *individual* can be submerged and the *manager* allowed to *rise to the surface*.

SO NOW TO THE JUNIOR ENGINEER

A junior engineer may be recently employed, or may still be an undergraduate getting work experience between semesters, on vacation, either way new to employment and the power game, which is played in every office in every organisation. The above outline of what is involved in the game may seem to suggest that those low on the totem pole must humbly submit to those higher up, because there is no way out of being subjected to boss-power, whether benign or tyrannical, does not matter, it is still oppressive.

Of course, there is the old-fashioned way of escape from being the subject of someone in a power-position, that is, *flight* from

the situation. For as long as the power-holder is backed up by those above (or those below), the usually expressed alternative, *fight*, is of no use, the only answer is flight. Of course, if the power-holder's backing-up can be cancelled so that support is withdrawn, fighting is not only possible, it is likely to be successful – but unlikely.

So the first step for the junior person is to understand what power is, to recognise it, to see through what the power-boss is doing, what methods he/she uses, from whence the power comes, and whether there is support from below, that is, from those around the junior person. What then?

It is possible to protect oneself against power or influence as exerted by others, and Carlopio et al outlines how to resist and neutralise such actions [15]. First, the three *influence strategies* must be recognised, these are as follows:

- Retribution (coercion and intimidation, based on personal threat);
- Reciprocity (exchange and integration, based on mutual exchange);
- Reason (persuasion, based on facts, needs or personal values) [15].

These are used as ways to *get around* subordinates to bring them into line with the power-person. But there are ways of neutralising each, methods that may not be totally successful, but worth utilising to try to make life more pleasant.

Retribution strategies, generally imposed on subordinates, are the most detrimental form of influence and, therefore, should be resisted. The first step is by focusing on the interdependence between the subordinate and boss (*we are in the same boat, so let us pull together*). If that does not work, move to direct confrontation with the influencing person, by making a direct complaint to him/her. The final and ultimately last resort is active resistance, perhaps reporting what has been going on to a more senior person.

A personal reminiscence here by the author. On one occasion, the author felt the need to make such a complaint to a senior person, but also felt unable to make it directly. So he did it by addressing a carefully-worded complaint to the influencing person (his boss) and leaking a copy to the senior person by mixing the copy in with other documents. This trick can only be used once.

Reciprocity strategies are much slyer. Whatever is offered, the motives of the one offering, that person's behaviour, and the probable consequences of accepting, must be examined closely (the old adage of looking into the horse's mouth). Next, confront the other person by showing the technique has been understood and ask: *what is behind the offer?* If then necessary, refuse to deal with high-pressure tactics, such as expressions of limited time or supply, which make the exchange unequal. (they usually do; the person making the offer intends to come out ahead.)

Reason strategies can be avoided by analysing, then explaining to the other person, what is understood about the proposal and the effect it will have if accepted. If that fails, defend one's own personal rights and appeal to their sense of fairness. Both of those operate by meeting reason with reason, if neither succeeds, then the final, *last straw* action is simply to say *no*.

CONCLUSION

Power, in the management sense, is such an interesting subject and of such importance that much more could be added to the above. We all experience it and we all, within our own limitations, make use of it. Fortunately, there is a moderately extensive literature on its background and application, so engineering juniors, whether working or still undergraduates, can gain some understanding of it and what to do about it.

Having begun with a quotation (Lord Acton's warning), let us end with an equally cautionary one from Hunt on the addictive nature of power, quoting Gellerman: *The possession of power creates an appetite for more power* [10].

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