

RESEARCH ARTICLE

Motivational Patterns among IT Specialists

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Abstract

IT professionals are generally considered to be paradigmatic knowledge workers – ready to work long hours independently, with high internal motivation. However, only 1/3 of IT projects are successfully concluded and motivation is considered the key factor for success of IT projects. Analyses of the ways in which IT specialists are motivated, both in scientific research and in practice assume a uniform approach to motivating IT specialists. Recent research however has shown that three different profiles may be observed among IT specialists in the US. These studies, however, are based on samples in which ca. 50% respondents were IT managers; this may explain the unexpected set of motivational profiles. The objective of our research is to verify this assumption. Qualitative research, conducted in Poland in 2011 on IT professionals who do not hold managerial positions, identified the same three motivational profiles. The article describes motivational procedures for each of these three profiles.

Keywords: *Motivational patterns, Motivation, IT specialist, IT management, Knowledge worker.*

Introduction

IT represents an important component of the contemporary economy, but the effectiveness of IT projects is far from satisfactory. Only around 1/3 of projects are completed with full success, i.e. goals are achieved within the projected time and budget [1]. Generally, motivation is considered the most important single factor influencing productivity of IT specialists [2]. Identification of the values that guide IT specialists in their work represents a necessary step for formulating recommendations on effective management of IT teams.

IT workers are knowledge workers that are traditionally considered mainly internally-motivated [3-5]. Their commitment to work (IT problem solving) does not seem to require external stimulation. From such a perspective, it is enough to provide highly-productive working conditions that do not interfere with their natural commitment to work [2]. Texts written by practitioners however frequently propose stratagems to increase IT worker productivity. They suggest that programmers in IT departments should be separated from external contacts and supplied with “pizza and visions” – goals precisely defined and input and commitment appreciated in the form of unlimited pizza and coke supplies [3]. Information is published on a physical work environment in which workers manage their

work time playing table football or table tennis and computer games, and chatting freely [6,7]. However there are signs that a model of white collar knowledge workers enjoying high prestige, security and freedom in organizing their work is no longer appropriate for analyses of IT workers. It is pointed out that they are becoming increasingly similar to call center employees [8], who use specialist technologies, have low employment security and relatively low remuneration, are closely supervised by ruthless¹ managers [9]. Kunda [9] describes the conflict of interests between IT workers and their managers (focused on careers within a hierarchic organization) while others [6] describe the weak position of managers in this conflict. Managers, who possess insufficient professional knowledge, have to rely on indirect indicators for evaluating IT professionals’ work, while IT workers devote more than a half of their time in the company not to work but to interpersonal contacts, including playing table football [6].

These three approaches feature IT workers as a uniform professional group despite obvious diversification within the IT professions. Several dimensions of this diversification are easy to

¹ One of our respondents said that managers believed that teams of IT workers are: “a career lever, i.e. at the expense of his subordinates the manager will do anything, squeeze out the ‘last blood, sweat and tears’ so that he can show that he is able to do something in one minute and for zero money” (MK 2011).

discern – concerning tasks, social competency level, or professional skills [10, 11]. Differences in service-orientation (i.e. contact with end clients) within the various IT professions seem to be a result of changes to a service-orientation made by Western IT companies, and of allocating production to suppliers in countries with cheaper labor. Competencies within the IT professions become differentiated – various types of people will be found in the various sub professions, suited to the tasks there, as a result of preselection and a continuous development of competencies. It has long been recognized that despite the high level of technical competences required from IT workers, on many markets the call for a higher education in information technologies among active IT workers is just a postulate [8, 12]. The rapid increase in demand for IT workers observed in India and the US have resulted in a rapid re-skilling to this profession, creating groups with highly diversified professional competences within it.

Some authors also point to an additional diversification – in the professional values of different IT workers. This issue has not yet been broadly broached in the literature and this text will attempt to develop on it. The goal of this article is to use a different kind of empirical material to verify the hypothesis concerning three different profiles of work values in IT workers. Profile of (work) values is understood here as the “needs and values that ([IT] employees seek to satisfy through the characteristics of their employment arrangements as their work value ... [where] needs are innate and required for survival, whereas values are acquired and represent what a person desires, wants, or seeks to attain” [13]. The statement that employees seek to work in a place that fits their work value profile lies at the heart of Person-Organization Fit literature (which uses the terms “value” and “need” interchangeably to signify motivational profile).

The text is organized as follows. A brief description of historical sources of the interest in IT professionals’ motivational profiles is followed by findings from the work by [13], presented together with their critique. Next, qualitative material from study conducted in Poland in 2011 [11] will draw attention to additional aspects of these profiles.

Motivational Profiles of IT Workers and the Issue of their Specific Character

The specificity of IT workers’ motivational needs has long been studied. A classic text from the end of 1970s states that IT workers are characterized

by higher levels of the need for achievement than other workers in both operational and managerial positions [14]. Critiques appeared quickly and pointed out that achievement need in IT workers is on a similar level as in the case of all engineers [15, 16], although up to the present high achievement needs are a stereotypical characteristic of IT professionals. Fierce competition and an environment in which everyone constantly evaluates everyone else, a kind of men’s sports club cloakroom atmosphere, are also mentioned [3, 17]. Introversion, a low need for social interactions, is the second most frequently mentioned feature of IT professionals. It is frequently linked to a lack of broader social skills, although other studies indicate the high value IT professionals assign to contacts within their professional group [2, 5].

The majority of empirical studies on IT worker motivation are conducted on the issue of key work conditions [2], the motivating work environment. This is natural, as there is no doubt that IT professionals strive for autonomy and independence, which is typical for work focused on independent problem-solving (although obtaining ongoing feedback during a project lasting for many months is not always possible). A review of studies indicates 16 different characteristics of IT workers [2], but the findings are not conclusive. The stereotype of the IT worker depicted by the common term of *geek* [11], as a person focused on success in solving problems, an independent and autonomous introvert who feels little organizational involvement, who strives for merit-based appreciation in the professional community, seems only partially correct.

It has been pointed out on numerous occasions that rapid technological change and ageing of IT competencies creates a continuous urge to work on projects that are not only interesting, but also offer opportunities for development of competencies important for the future. In effect, despite a spontaneous readiness to share knowledge and work for the community by solving IT problems (a flagship example is the open source software movement), internally motivated IT professionals must plan their careers and develop chosen competencies, and cannot just happily work on challenging projects, forget themselves in long hours of work and enjoy the moment.

With value assigned on a meritocratic basis, the IT profession is full of dangers. Your value as a professional and human in the eyes of your peers

depends on your efficiency in solving constantly changing IT problems, which requires not only creativity but also an in-depth knowledge of technology, surmounting old ways of thinking and continuous learning from the best. Work within a difficult, future-oriented technology and in a highly-qualified team is often considered to be the only secure way of maintaining your professional efficiency – assuming that the technology does not prove a dead end in IT development and that your intellectual capacity does not diminish.

Solving interesting problems in a way that is useful to the user and algorithmically elegant may be a test of professional efficiency today, but it gives no guarantee of success in the future. IT professionals quickly achieve a high professional capacity, and at the same time only the egocentric belief in their exceptionalism lets them look with confidence into the future. In effect there are many successful and acclaimed IT professionals who are also immature personalities [18].

As a consequence, managing IT teams requires not only content-related competence (as in the case of every management of specialists), but also skills in gaining the esteem of people who accord highest value to IT knowledge and professionalism [13, 14]. Becoming a project manager usually signifies a rapid loss of IT competencies (which is different than in the case of other types of jobs). IT professionals in the role of respondents, warn against incompetent managers: “I suddenly found myself in a team managed by some “mutton-head” who does terrible things and lands his team in constant problems (MK 2011)”. True IT professionals therefore stay on the technological path and strive to develop their competencies in a way matching changes on the labor market. They believe in their excellence and are not afraid of losing their solving-problem competencies; any additional courses and certificates that the employer can purchase are simply indirect evidence of their professional proficiency. Like every knowledge worker, IT workers believe that good IT specialists are recognized through their actions, including how they solve an IT problem, and that to be good (and in consequence employed), personal proficiency acquired due to innate abilities and experience in the field of IT are sufficient. One of our respondents told us that finding work in newer technologies was not a problem, because he had “solid education, second - abilities and third - experience (MP 2012)”.

Differentiation of Motivational Profiles among IT Professionals

To date, research on knowledge worker differentiation has focused on differences between professions [19, 20]. Differentiation within the profession is rarely analyzed beyond studies of personality differences. Of interest therefore are models of motivational profile differentiation in IT workers which focus not on describing in greater detail the requirements (naturally made by knowledge workers) concerning work environment, but on the large differences in expectations concerning this environment between different sub-groups. According to our best knowledge, the only such categorization for IT workers, to be found in several papers, identifies three separate motivational subgroups.

Basing on different samples [13,21], it was found that ca. 1/3-1/4 of IT workers (named the *geek group*) possess a profile characteristic of the stereotypical geek – high achievement need, strong striving for autonomy and freedom, and low need for security, frequently linked with a very high perception of own value. This classic type of geek, for whom communication is expressing oneself, and not striving to understand the intentions of other parties, with a highly developed ego and resultant strong competitiveness, has often been described in the literature. This attitude is best illustrated Steve Wozniak, co-founder of Apple, who used to say that “You will design revolutionary products and their revolutionary features best when you work alone. Not in a committee. Not in a team.” [22].

A second significant group of IT workers (named by the authors of this classification *the committed group*) features a strong need for security beside a strong achievement need, and does not strive for high levels of freedom and autonomy. The studies showed this group to be the most numerous, representing from 1/2 to 1/3 of all the IT workers surveyed – although this could be the result of a significant proportion of the respondents being IT managers² from various levels. This group assigns low importance to freedom of choice – in organization of working hours, place of work or travel. Although in the study freedom of choice was operationalized as freedom to organize working time, it also represents consent to limited autonomy concerning other conditions of work.

² In the group described by [8], middle level managers represented as many as 30% while higher level managers 24%, which explains the decrease in the percentage of the *committed* in younger employees to 35% (as compared to 42% among the older ones; the average for the whole sample – 39%). Studies described by [18] had in one sample ca. 20% of IT managers of middle and higher level each and 20% of IT managers from all levels in the second sample. The percentage of managers may have a significant influence on the differences in frequency of appearance of each of the three profiles because, as indicated by some managers in our research, they do not feel IT professionals (despite an IT education and holding the positions of IT managers), which suggests that they may have a different motivational profile.

This does not signify that hygienic work conditions – a highly involving working environment in Hackman and Oldham's terms – are not provided. Characteristic of this profile is consent to limit one's freedom of choice concerning working conditions in exchange for satisfying a high need for security. The need for security variable is operationalized as comprising full employment, level of remuneration and additional benefits.

The third group consisted of employees with high need for security and freedom of work, coupled with a low achievement need. It was named the *lifestyle profile* because this group does not assign value³ to the core expectations typical for knowledge workers in an organization (i.e. career development opportunities, freedom to choose tasks to become involved in, expressions of appreciation from the organization). One of our respondents said openly: "Career making doesn't appeal to me. I am not in it for the career so it would be pure theorizing on my part to say what it means to make career. I can honestly say that I can't even imagine what it would mean." (MP 2012).

With respect to professional development and career planning, they seem to be independent of the organization employing them, and with an internal locus of control they do not need expressions of appreciation from the organization. This lack of interest in developing a career within the organization, be it on technical or management paths, and the low level of expectations concerning opportunities for competency development needed for a career may be the result of family duties (raising children), or stage of career (desiring greater balance between professional and personal lives, or preparation for retirement). This group features an equally high level of the need for security as the *committed* group (a relative weight of 77% as compared to 50% in case of typical geeks), and a high need for freedom in organizing their work (even higher than in case of the *geeks* – 55% compared to 50% – and evidently lower than in case of the *committed*, i.e. 28%).

Testing the Differentiation of IT Workers using Data from Qualitative Surveys Conducted in Poland

It should be noted that the research described above did not measure the importance of a given value directly via individual declarations, but through comparative ranking of the weight of

responses of a given sub-dimension⁴ on a Likert scale.

The researchers had to apply formal tools for organizing responses to differentiate the weights of declared values characterized by high approval, as all the values represented in the questionnaire were, in the respondents' opinion, important and highly approved. However, a relative ranking of questionnaire responses identified three separate profiles of expectations among IT workers. Such a diversification procedure is incorrect methodologically⁵, because it treats the Likert scale (a weak order scale) as if it were an interval scale (counts the averages of scores to be able to conduct the ranking).

Even a commonsense-based attempt at overcoming the difficulty posed by high scores obtained from declarations of values by the introduction of relative rankings among the values obtained in this way must raise doubts for at least two reasons. Small differences between the values chosen individually by means of a number of indicators may be obliterated by combining those choices into a single category. From the perspective of the respondent, allocating scores to values by counting the frequency of scores and forming them into the ranking creates (artificial) differentiation where for the respondents the values are not differentiated. Combining subjects separated by individual (artificial) rankings into subgroups within the population may mask differences between them, eliminating actual diversifications in values and expectations.

None of these arguments can be applied to qualitative surveys in which the respondent, within the frameworks of unrestricted biographic narration, illustrates how different values are manifested in his life. Unrestricted biographic narration makes apparent real (and not only declared) values guiding the individual in his life choices, and stories revolving around this value give an understanding its importance for the individual's life. F. Schütze's biographic interview [23], in which a phase of unrestricted biographic

⁴ "Rather than utilize the raw scores [which range from 1 through 5] on importance of work values, we used computed ranks to alleviate such problem [individual preference for severe rating]...our classification procedure places a respondent into the High Committed profile if the rank of the job security is greater than or equal to 4.5" [18, p. 357].

⁵ Measures created by formally correct transformations of the Likert scale into an interval scale by summing response frequencies and introducing a scale based on these frequencies are strongly dependent on the number of indicators assumed for each of the sub-dimensions, their operationalization and weights allocated to the individual responses on the Likert scale. In conclusion, there is no methodological justification that the interval scale on which rankings are based corresponds well to Likert's weak-order scale.

narration is followed by answers to pre-prepared questions, tests whether values bypassed in the unrestricted narration are of equal importance to the respondent.

Research testing the hypothesis on the differentiation of IT workers (non-managers) into three sub-groups with different motivational profiles was conducted in Poland in 2011, in a group of IT professionals responsible mainly for creating and servicing database software for the financial sector [22]. The study consisted of a questionnaire identifying problems in IT team management and in relations between the IT professionals and users. Next qualitative research was conducted using F.Schütze's biographic interview method. 20 respondents talked about the consecutive stages of their professional lives, the changes that have taken place and causes of these changes. Probing questions were then posed to collect information on professional career planning, striving for professional stability, managing IT professionals, relation of age and gender to the requirements of the profession and the work-home conflict [22]. All three of the motivational profiles were identified:

- Geek⁶ – high achievement need, strong drive for autonomy and freedom at work, low need for security, and high perception of own value;
- Committed⁷ – high achievement need and strong need for security, does not strive for high levels of freedom and autonomy;
- Lifestyle⁸ – high need for both security and freedom of work, medium achievement need, independence of personal goals from the organization and low sensitivity to expressions of appreciation on the part of the organization in which they work.

We cannot forget that the diversification of IT workers' motivational profiles is obscured by the obsessive relation of IT workers to the products of their own work (geekwork, to use P.Glen's term [3]). This is a characteristic of IT workers worldwide, although in Poland it is more noticeable because prior to 1989 IT products in

Poland were insignificant because very few programmers developed software for business⁹. The diversification of IT workers' needs seems to disappear in extreme situations – when their work is fascinating and the need for it apparent or, on the other hand – when it is poorly organized and seems pointless. One of our respondents with a high need for security (a *committed*) resigned from her job when she noticed that her company made a wrong decision concerning IT development: “the president initiated the bank's computerization using PCs ... I immediately filed my notice ... I told them that the concept of servicing a branch with a single PC was unacceptable (AC 2011)”.

Conclusion

The text makes an attempt to verify the diversification of motivational profiles among IT workers basing on different empirical material. Earlier studies on the management of IT workers treated them as a relatively homogenous group as concerns their expectations related to the motivational work environment. Recommendations for management to be found in the literature, based both on theoretical analyses and practical observations, are attempts to develop a uniform model of a motivating work environment for IT workers. If IT worker motivational profiles are diversified as indicated in this article, then management recommendations concerning these workers require significant revision.

Only the classic geek (the first type) will feel ideally in the work environment postulated by such authors as Glen [3]. In the case of the other two types, greater care has to be taken to satisfy their need for security (as compared with the geek). Personal relationships with the project manager when defining tasks and precise milestones are no longer sufficient. Joint responsibility for the project requires that both of these types receive adequate support if problems appear. This safeguarding, however, is achieved in slightly different ways – directive management is acceptable for type 2, while type 3 requires facilitative measures to assist thinking. These two types react in different ways to expressions of appreciation on the part of the organization or when offered opportunities for competency development. These are valuable for type 2 (confirms its need for security and achievements) while type 3 perceives them as manipulative (i.e. having other, undisclosed goals). This highlights the need for a different approach to training needs

⁶ Only some quotes from the interviews are cited in this article to illustrate the three profiles – a wider selection narratives, research methodology and argumentation are available in LW. Sample respondent quotes [concerning the causes of quitting work in a large corporation]: “many of my ideas are wasted or not used. I suspect that many people working in large companies who are creative and innovative harbor such feelings.” (TJ 2011).

⁷ “I used to be a senior programmer and they tempted me with promotion that jumped two levels.” (AC 2011). “I told them that I was fine, I felt needed. I was even driven with my leg in a cast to meetings ... [but later] sweating over those balance sheets tired me so much that when Zbyszek offered me the post of administrator I agreed”. (AC 2011).

⁸ “I generally appreciate the fact that I have a permanent salary and I know what I can expect; but a bonus system ... if that meant an inflow of cash then fine, but if it's the opposite that's not nice.” (MP 2012).

⁹ “We were very much afraid we were writing software “for the drawer”, that was the main motivation not to make software “for the drawer”, to do something that would be useful in life.” (KL 2010).

analysis – type 2 is willingly to participate in training programs proposed by the organization, while in the case of type 3 only the trainings of his or her own choice are of any value. Our differentiated, brief management recommendations, based on the specificity of motivational profiles diagnosed in the three types of IT workers, suggests that further research needs to be conducted, to confirm the existence of the suggested diversification. The biographic interview method used in this analysis shows that it is relatively easy to identify the motivational profiles in different IT groups. Our results suggest that the differentiation described here is probably not specific to US IT workers, as at least one other IT professional community in a different national culture shows analogous value profiles.

The classification of IT professionals into three motivational profiles conducted with the use of the two methods described above has several limitations. First, questionnaire-based surveys

cannot determine whether declared values represent a permanent attribute of the individual or are just a momentary opinion. Qualitative studies are in slightly better in this respect – by analyzing the repeated threads in the career story it is possible to diagnose the respondent's motivational profile with a higher degree of certainty. It is difficult, however, to determine its permanence because the perception of past events may be altered significantly by the current life situation. Second – the motivational profile as driver is subject to strong situational influences. Changes in orientation within the professional life span should come as no surprise – being the result of changing personal needs (e.g. the appearance of a family to be supported) or priorities at work (appearance of an attractive opportunity) should not be a surprise. The scale of this variability requires further research, to make management recommendations resulting from the current analyses useful.

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