Three Views to a School Information System: Wilma from a Sociotechnical Perspective

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Three views to a school information system: Wilma from a sociotechnical perspective

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Abstract. Visma Wilma has become a standard in Finnish school system as the de facto school information system for teachers, parents and students to use. Whereas the digitalisation of the school system seems inevitable there have been some issues in the information system design to promote practices and values that are suboptimal – or even substandard for a school as an entity.

In this paper we analyse the Wilma system from sociotechnical perspective with three different viewpoints: students', parents', and teachers' and bring out requirements and recommendations on how Wilma should be constructed in accordance of the aforementioned practices and values in mind.

Keywords: School information systems, Information systems, Ethics, Sociotechnical perspective

1   Introduction

Digitalisation is an on-going process in our information age and the school system is not an exception. As both the public and private sectors have pursued to ease up the communication and information processing with new information system solutions, the school system has also been inundated with changes: blackboards are now smartboards, Moodle and other electronic platforms are turning to be a preferred way to return homework, students get email addresses from the schools etc. It would be surprising if there would not be systems for the students' timetables or possibility to contact teachers via the internet.

The Finnish school information system Visma Wilma (formerly StarSoft Wilma) is the interface part of Visma's school information system package (with Visma Primus and Visma Kurre) developed to ease communication and sharing information within schools, between schools, and between students and their guardians (henceforth parents). With the system students, teachers, and parents can share information and view timetables. [1] It is usually seen as "a school journal", a notebook traditionally used for communication between school and home, but it extends to a be-all-end-all system for storing information about school activities [2].

The digitalisation however does come with a price tag. The analogue systems were not subject to digital divide or hacking, nor were they so pervasive to the social structure of schools and homes. Still it is clear that digitalisation also brings utility for the

easiness of both communication and acquiring needed information. However, the new digital information systems bring unintended consequences some of which could have been mitigated and some clearly come unforeseen.

In this paper, we analyse the Wilma system from a sociotechnical perspective, a lens and a viewpoint from which one can reflect the world, by analysing the main interest groups: teachers, parents, and students to understand where these unintended consequences can be mitigated with the current knowledge. Note that in this case, sociotechnical theory is used as a perspective, not as a theory per se. We discuss the analysis and present proposals on how Wilma and similar systems should be used and how future systems should be constructed to better support the co-operation between these interest groups.

2 Sociotechnical perspective

The term sociotechnical system was coined in the coal mine study conducted by Trist and Bamford to describe the relationship between human beings and technology in 1950's [3]. Sociotechnical theory was a counter reaction to 1950s Taylorism. Taylorism was created on the idea that a system could be optimized with standardisation of work and by making working more efficient with technology. [4]

Trist and Bamford [5] acknowledged that machinery that was supposed to make coal mining more efficient actually caused problems and dangerous situations. They argued that this was due to neglecting the miners when designing new solutions. Later, similar studies were conducted with similar results: both technical and social systems should be taken into consideration when designing a system that works optimally [3]. Thus, instead of focusing only on technical system, one should also consider aspects such as work tasks and people doing the work so that the system would be as effective as possible and to avoid undesirable side-effects.

Since 1950s sociotechnical theory has inspired people to design more democratic information systems, but it has also faced a lot of resistance, mainly because it was considered to be time consuming and leading to ineffective processes in manufacturing. However, work in general has transformed from manufacturing to being more and more knowledge work. [6] Change in the characteristics of work highlight the importance of human beings in the information system design, thus making sociotechnical perspective a fruitful framework to analyse modern information systems.

From sociotechnical perspective an organization is a system that has social and technical subsystems. The social system (human beings) uses the technical system to produce something to clients that are outside of the organisation. Thus, these systems are in constant interaction with each other and the environment. The social system contains human beings, their traits and relations to each other and to the organisation that they are a part of. [7]

Since people are the core of the social system, the quality of the social system can be observed only by taking into consideration subjective experiences of the individuals in that system. Their interpretation about their relation to their work tells how the social system is working. [6, 8] Thus, when designing or researching a sociotechnical

system, one should aim to the participation of people who are using or connected to the technical system [7].

The technical system that the social system is using can be considered to contain both tasks and technologies [9]. Thus, the technical system is much more than technology. As Mumford [10] states, technology is much more than an artefact since it almost always contains some kind of processes that have specific phases and a target. These processes are conducted by people, so there is a constant dependency between technology and human beings using that technology [10].

Thus, a sociotechnical system can be seen as a whole that contains both social and technical systems which are inseparable from each other due to the constant interaction in the social environment. This constant interaction can have unexpected consequences. [6] This challenges the idea that one can achieve predictable consequences with technology [4]. To avoid unexpected negative consequences and to achieve as optimal a system as possible, one should analyse the sociotechnical system as whole [6].

From this perspective, an information system itself is a sociotechnical system that contains both a social and technical systems that are used in certain environments. The technical aspect of the information system is the electronic information system and the social system is the users. So that the whole system would work in the best possible way, it should be taken into consideration what the users want and need in relation to the technical system [11, 12].

It should also be kept in mind that since the interaction between the social and technical systems is continuous and the environment that they are placed in is rarely static, information system development should be a dynamic process from use to development, not vice versa [13].

The technical system in this case is Wilma and the tasks that are connected to it. Due to the nature of this system, there are different social systems that are connected to this technical system: teachers, students and parents. In the forthcoming chapters we analyse the system itself and these three interest groups with focus on the undesired and unpredictable consequences that could have been foreseen with careful analysis beforehand and still could be corrected to create an optimal system for schools, students and parents.

3   Wilma

Wilma is a technical system with multiple functions for multiple stakeholders. To teachers it is a tool for evaluation, marking absences, and communicating with the parents. To parents it allows the monitoring of students' school activities and communication with teachers. To older students it can be used as a messaging forum with private and group communications, course feedback, questionnaires, electrical application forms, formal decisions, the history of grading and "much more". Information is delivered immediately to the parents (via the system itself and through email) and can be used with all common browsers, and iOS and Android apps. [1]

Wilma was implemented during the 2000s to large amount of Finnish schools and is used in most of the Finnish municipalities as one of the primary tools in teaching. Some teachers claim that one cannot get employed without skills to use Wilma [14]. One indication of the dominating market position is that no teacher allowed themselves to be interviewed for this study without anonymization. Some parents feel that the system is frustrating and it is not clear what the point of Wilma in general is [15, 16]. Many also view the system often as a "student criminal record" [17-20].

Evaluation is essential in schools, but Wilma has turned the evaluation of the students and their behaviour, rather than their achievements, easy and constant. Although Wilma has been intended to be used as a conduit for constructive feedback [see e.g. 21], many entries are merely critiques or notions about behaviour. Although Wilma entries are not meant to be personal critique towards the students and their developing identities, they can be interpreted as such by the students [2].

Oinas, Vainikainen and Hotulainen [22] noticed that both negative and positive feedback is given but boys receive more negative feedback than girls and the feedback is also distributed unevenly among students so that negative feedback is concentrated to relatively small number of pupils. They argue that for more equal treatment of pupils and to prevent harmful effects of constant negative feedback specific guidelines are needed.

The owner and developer of Wilma, Visma [21] admits that electronic communication can easily be misunderstood. They claim that the reason for this is partly that sometimes less attention is paid to communication when it happens in electronic form than when communicating face to face or in phone. [21] Written communication is indeed more easily misunderstood since it lacks the non-verbal cues such as tones of voice or facial and bodily expressions that are quite essential to human communication.

Furman [21] also notes that the Wilma system is not adjusted to work in schools in a way teachers and parents would want it to work. For these reasons, they have published a guidebook about communicating through Wilma. This guidebook represents the ideal way of communicating through Wilma, but only concentrates on how teachers should communicate to parents. In brief the guidelines for teacher's interaction are 1) tell how you wish that the student would act and what are the benefits of desired behaviour, 2) create faith in possibility of success, and 3) show that you consider the guardian to be the expert of their child. [21]

Many of these guidelines refer to situations where there is something negative about the behaviour of a student. The guidebook highlights also the role of positive feedback and represents ways to give positive feedback through a third person, collectively, and in problematic situations. [21] However, the guidelines do not give tools on how to give positive feedback about student's behaviour directly to the students, but only to their parents.

Furman [21] also acknowledges that communication might raise some negative emotions even though messages are not intended to critique parents. However, it is obvious that current guidelines do not give students or children an active role, but rather are aimed to keep the parents calm and informed about their child's (wrong) doings. Wilma seems to feed the idea that no feedback is good feedback, although

also positive feedback would probably be appreciated by both the parents and the students.

Wilma in reality is not all about negative feedback, since it allows teachers also to praise good behaviour [22]. Alas, maybe due to the aforementioned "no feedback is good feedback" attitude, negative feedback options are overrepresented in the system. There has been discussion about Wilma having 8 negative feedback categories and only 2 positive ones. A teacher that raised this issue to discussion in Facebook felt that there should be more options for the students to gain positive feedback [2].

The information reported to Wilma is private but yet it is delivered to the parents of the child. Hence it seems that the privacy of the child's day is no longer guarded but is reported to the parents piece by piece, thus enforcing a new type of Panopticon to the child. Moreover, Visma company acknowledges that there are no proper guidelines or practices on how to use this new technology and hence the end decision whom to report and on what is a decision made by the teacher. (Reference withheld) [2] state that it "is relative both to the student and the teacher alike what actions from the day are reported – or is anything reported at all. Thereby equal treatment of subjects – the adolescent – is nearly impossible."

The system seems to be a substitute for an adolescent 'criminal record', but with the exception of fair treatment: the markings come with no trial or other method that guarantees the 'convict' a fair possibility to defend oneself. Yet these markings may stay there for an eternity because this criminal record is not administered by the central government but the IT-supports of the city governance and the practices on how this information is stored is not public. Thus the information can be stored and accessed much later – and possibly by those not permitted to do so to be used against the citizens. [2]

4   Teachers

The role of the teacher is manifold. Whereas the title implies that the person with the title teaches there is more to it: foremost the teacher is a pedagogue with a responsibility to be the guide to adult world in all matters academic and in some matters social. The teacher is a referee, a guide, a substitute parent and the police, judge, and executioner – the foremost authority – during the school day. The task is not easy. Although the teachers are limited with their power they might still appear omnipotent and omniscient – at least to the smallest of the kids – but not to the parents. To the parents the teachers should represent themselves as specialists and experts of their specific field and the information systems should support that.

Yet it seems that systems like Wilma make the teachers represent themselves as mere informants of the children's daily activities during schooldays who outsource the keeping of the order in the classroom to the parents. The parents – kids of the yesteryear – assume (rightly?) that the teacher keeps the order and teaches their offspring to read and write, whereas the school has evolved from those years. The teachers are for example not allowed to use physical or even emotional punishments

against the kids and that leaves them without the options of the teachers of the parents' times.

The balance of power due to the modern child-protective legislation has turned in favour of the students who are more and more aware of their rights and therefore these new tools to "punish" the kids boil down to complaining about them to their parents and then hoping that the parents guide the children. If that does not help, the teacher at least has a good set of information to turn in the kid (and the family) to the child protective services. Wilma is a solution for this problem – at least in part. It delivers the teachers' notes to the school district, to parents, and to the (older) students.

But there is of course a snake in the paradise. Wilma is meant to be a tool for the teachers and with this tool the teachers' work is predetermined. It is supposed to support the actual work tasks – teaching and pedagogy – by easing up and saving time for this purpose. Instead of different possibilities for communication teachers are forced to use this system as the main means of communication and information processing – even if they do not have enough information on how to use the system or feel that the use of the system is in contradiction with the idea that they see as proper pedagogical practice. In addition they are encouraged – sometimes strongly – to do (even daily) minor reports on the students. [14] Even more, as the information processing has been made easy, the requirement of the amount of information is raised to meet the possibilities of mining the information.

The Wilma activities of the teacher can also be monitored. The amount of feedback can be used as a measurement of the teacher's activity and efficiency and the feedback given can also be used against the teacher. And since the tool is there to be used, the teacher is also recommended to use it as a tool to keep order in the classroom. Sadly though, there are not that much of "best practices" for the teachers to deal with these reports and thus they tend to be small, 5 to 10 word comments (with bad grammar!), not describing the situation well enough (due to lack of time to report), and vague enough not to get the teacher prosecuted. This of course leads to unintended consequences and thus to additional problems. Even with small additions to the Wilma system, writing them for each (or at least most) of the kids still takes its own time, which is either extra unpaid work or away from other, more constructive work such as planning classes or grading exams. [14]

The system also supports situations in which the teacher can misuse the system to punish a student, even for an act which they have not committed. This can include situations where the teacher has ended up in a disagreement with the parents or because of a quality, trait or feature of a student that the teacher for one reason or another disagrees with. The feature can be used by writing a report to the system and by marking and using those markings as a proof and stigmatisations thus justifying a harsher punishment. Yet, peer influence of other teachers can lead to situations in which teachers are more likely to write more positive comments or not to write negative comments due to the amount of positive reports done by their colleagues. [2] For example Oinas et al. [22] have stated that especially negative feedback seems to accumulate to certain pupils.

5   Students

The main role for the students in the Wilma system is to be targets of the use. Whereas the teachers produce the material and the parents (ought to) read and act accordingly, the students are rather passive targets with only little direct contact to Wilma system. Pupils (grades 1-9, under 16 years) are rarely the users of this system whereas older underage students can have their own accounts to use these systems aside of their parents.

The students can roughly be divided to two groups: children (age between 6 and 11) and adolescents, i.e. the age between childhood and young adulthood (ages 12 to 16). This division is used by the Finnish school system and thus the adolescent get more privileges and more responsibility in the school life and their teaching is moved from single-teacher classrooms to specialised teacher classrooms. In the latter they participate in more course-like school experience with specialised teachers teaching their subjects rather than one teacher teaching every subject for their own students. Thus, the adolescent also are able to access their own Wilma account and see the feedback themselves whereas the children usually cannot.

Whereas the children require more constant care and attention, and require more limits and control, the adolescents are slowly starting to become adults. Teenagers are going through a set of physical, psychological, and social changes, and are in process of turning into adults which is why they are in the midst of developing their cognitive skills, identities, morals etc. and this is something the school supports (or at least should support). Hence the Wilma system should have two different goals: for the children and those working with them the system should support different set of values than for the adolescents and those working with them. In this chapter, the adolescent are more in the focus, but the children are not forgotten.

It must be kept in mind that the system should exist only to promote the students' learning and welfare – because the school exists for that reason (and for the reason to keep the kids occupied during daytime). Therefore, a system which does not support this goal is not a proper system for this task [see e.g. 23]. Moreover the system should follow the values of the organisation [24].

The Wilma system should promote the values of the school system. None the less it seems that the Panopticon system of Wilma turns the students into subjects of an Orwellian society: it teaches them that their actions are recorded and can be used against them– and that it is normal.

Therefore the feedback given is in a major role on how the adolescents keep on the "positive track". Whereas the role of the adolescent is turned to a passive role of avoiding bad feedback instead of learning about the balance of good and bad feedback, the actions of those adolescents will change. As mentioned earlier, in Wilma the attitude seems to be "no feedback is good feedback". Whereas the narrative should be guiding towards good, now it seems only to be guiding away from the "bad" or "unwanted" and when the proper feedback is lacking the feedback might deem the adolescent as "bad" themselves.

It is important to remember that the children and the adolescents talk about Wilma and compare the feedback amongst them. Where some teachers are eager to give

feedback through Wilma, others are not. Other students tend to gather more feedback from all of them and it is not always all of their own accord thus they might feel unjustly deemed as 'criminals'. Moreover, the problem comes with the parents. As some parents use the Wilma function of getting every report in their email instantly, others visit the system once a week or even rarer just to sign the reports. This difference in attitude also reflects to the students as where some parents take these notifications seriously – or even by overreacting – others have more laid back attitude towards any of them. Hence other students are quite afraid of getting any negative feedback others just don't simply care and therefore using these notifications as means to punish or keep order seems somewhat unfair. [14]

Reference withheld [2] introduce a rebellious movement – one of the aforementioned defence mechanisms – in teenagers: the Wilma ruined my life Facebook group. In this group, the negative feedback gained is turned into positive. As the intent of getting the adolescent humiliated, they publish these notions and seek positive attention from their peers. In Wilma ruined my life group negative feedbacks are often seen as humoristic and even competed against each other for the best feedbacks. [2] More current phenomenon is an Instagram group where teenagers share their life with Wilma reports [25, 26].

As the whole teacher-student-parent relationship seems to be problematic and Wilma or similar systems are not going away, more research on this effect to the students should be done as soon as possible to understand the change in the mechanics on teacher-student-parent relations due to digitalisation.

6   Parents

One of the key issues is to notice the parents' role in this information system. Whereas they are the factual guardians of the students, they have also a role of verifier. When raising a child it is not sufficient to keep up boundaries and check that the future taxpayer will do as told and as required, it also requires defending and protecting the kid from harms and abuse.

The system however has changed the process from face-to-face or phone discussions to stored digital discourse where the teacher's role is to inform the parents of the malpractices their offspring have conducted. This leads to two problems:

1. Most of the feedback is negative.
2. It is not discourse, only informing.

As most of the feedback is negative and – as mentioned before – in very short form, it may trigger a defensive reaction from the parent. Surely some of the parents think of their kids to be perfect and never to be able to conduct malicious deeds, but most of the parents should be able to understand this. Moreover, the acceptance of the level of negative feedback (especially with the lack of comparative data) might affect the parent-child relation or parent-teacher relation – most likely both.

If the discourse is lacking, the only two options for the parent is to accept (and sign) the students' wrongdoings or fight back. Neither of these options is actually discussing and therefore "the battle lines have been drawn". This usually leads to *user*

resistance, where the users rebel against the system – actively or passively. Whereas Ali et al. [27] define user resistance manifestation as *"[it] may manifest itself in a visible and overt fashion (such as sabotage or direct opposition), or in a less obvious and covert action (such as inertia) to stall and ultimately kill a project."* In addition, it can manifest itself to an already implemented system which is an organisational change to the users that are included in it – that is the parents – who see the change from the point of their days in school. This resistance should be minimised in accordance to acquire effective and functional use of the system. [27]

One problem with Wilma is that the information flowing from the school is almost constant even though it does not require any action from the parent. This constant information flow might cause "information overload". The messages (when used with the mobile app) may interrupt the parents too often and if they are checked only once per week, there is a problem of "a fair trial".

If the parent uses the system rarely, other problems arise. Most critically some important or urgent information might be lost (e.g. permission to participate to a field trip). Secondly, the information is targeted to separate sections of the day (e.g. Tuesday morning 8-10 a.m.) and if discussed about with the child Friday afternoon, the kid might not have any recollection of the event. Therefore, the instant feedback the kid should get from the "wrongdoings" and the possibility for the child to defend oneself against those "digital accusations" is limited – at the best. Moreover, the learning from the "wrongdoing" is lost and all that is left is an overall bad feeling with a hint of inadequacy. This will affect the child's sense of self and most likely the child's sense of justice.

Therefore, the problem of what is important to intervene with when rising a child is outsourced from the teachers to the parents – who do not have the full picture but merely a dozen ten-word descriptions and a forgetful child. Moreover, the parents interpret the messages differently and the kids can have different consequences from the parents with similar track records since there is no guidelines on how the teachers should write these and how should parents react to these reports thus more affecting to the sense of justice and self.

7 Discussion

As shown above Wilma and its use has an impact on how the communication between the home and school is done and is hugely dependant on the personalities of those using it. It is also clear that the feedback given should be done in different manner to counter the inevitable misunderstandings. Moreover, the use of this information system leaves a lot of open questions about how the responsibility between the school and home about the child's behaviour in and out of the school should be distributed.

While it is important to notice that digitalised systems such as Wilma ease up the day-to-day life both in school and at home and that information can easily be derived for the stakeholders to analyse and utilise, there still are problems to be dealt with. First and foremost, it can be argued that the effects of the chosen methods – e.g. the Panopticon-style reporting of children's daily activities and giving mainly negative

feedback – are not studied enough to be used within the pedagogical environment in this scale without taking a huge risk on what kind of future citizens we are rising.

Yet again the increase in the workload of the teachers as well as the change in their work routines can lead to diminished results in teaching. Whereas a teacher could use the time spent with Wilma to focus on teaching, some of that time is now used on reports of minor annoyances the teacher has encountered. Moreover, if the teacher is required to focus on these annoyances it might turn the teaching event towards more classroom discipline oriented event.

As the parents react to Wilma in different manner, the effects of the reports may be actually be undesired by the teacher or the school. While other parents try to coach their offspring not to get these markings, others will rebel against the system, start defending the child against the system or just stop caring about the reports at all. This of course affects the students' view of the reports as punishment as well.

As the students may deem the system to be unfair it also implements reactions of its' own. As some might suffer from the feeling of being "bad" or "unwanted" due to negative feedback, others try to manage with it by making fun about it. None the less the effect can easily be an undesired one – again.

Whereas the consequences seem to differ according to the user (or the target of use), one thing seems clear: the system – as used now – can clearly increase confrontation between school and home, teachers and students, teachers and parents, and parents and children. Whereas the school environment should be constructed to be co-operation between these stakeholders, a constant flow of short and negative messages are not likely to promote it.

From the sociotechnical perspective, it is crucial that the work is meaningful. As discussed earlier, there are various parts in which the meaningfulness in using this information system can be arguably questioned. To improve the Wilma system, one must focus on the factors that not only promote the functions and the data gathering of the system, but also make the system to be a credible, functioning tool which makes the users feel that time spent with the system is profitable – meaningful.

As a solution, the use of this system – and every other school information system – should promote the values the school should aim towards: openness, fairness, reasoned dialogue, and co-operation in meaningful way. If the system is designed – or even used – with these values in mind, the system should improve the day-to-day school-life.

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