CASE STUDY

Results of the Study to Evaluate Optimal Office™

At Aurora Healthcare, Sheboygan, Wisconsin, USA | January 2004 – July 2004

Logisens Corporation conducted a case study at Aurora's offices in a billing department. The workplaces were in a cubical environment. The objective was to test Optimal Office™ in PC workplaces in order to evaluate its usefulness and effects. For a description of the device and the program see the appendix.

LOGI SENS

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Areas of Evaluation

Three areas of evaluation had been chosen; the study design and the results are in the first three chapters:

1. Psychological measures; burnout, work stress and life and job satisfaction. These were tested in self assessment questionnaires
2. Return on investment, tested through department productivity measures.
3. User friendliness and ease of use.

Quotes from users and management give background how Optimal Office was perceived in everyday use.

A technical description of the device and program is given in the appendix.

Psychological measures, Study design

A test group of users of Optimal Office was chosen from volunteers out of about 63 workers. The test group, which was given Optimal Office, had 10 members. They worked at computer workplaces in a cubical office environment, at least 5 of 8 hours at the computer, in tasks requiring at least occasional use of the mouse. The members were all female, age 26 to 57, average 42.2.

On January 8th 2004 the Optimal Office was installed on the work-places of the test group. A one-hour introduction and training for the Optimal Office device and program and the first questionnaire assessment were conducted. Further questionnaires were given to the test group roughly every 6 weeks on February 23rd, April 1st, May 12th and July 23rd 2004.

Data from the study questionnaires

Three topics were tested: Burnout, work stress, life and job satis-faction. The following questions were used. Every question had a scale on which users had to circle one of the answers:

Burnout

21 questions on a scale from 1 to 7, (from Pines A, Aronson E, Kafry D. Burnout: From tedium to personal growth. New York: Free Press, 1981)

How often do you have any of the following experiences in terms of your work? (in the last 4 to 6 weeks). Please use the scale.

1. Being tired
2. Feeling depressed
3. Having a good day
4. Being physically exhausted
5. Being emotionally exhausted
6. Being happy
7. Being "wiped out"
8. Feeling "burned out"
9. Being unhappy
10. Feeling rundown
11. Feeling trapped
12. Feeling worthless
13. Being weary
14. Being troubled
15. Feeling disillusioned and resentful about people
16. Feeling weak and helpless
17. Feeling hopeless
18. Feeling rejected
19. Feeling optimistic
20. Feeling energetic
21. Feeling anxious

Work stress

7 questions on a scale from 1 to 7, (Job Characteristic Questionnaire from: Etzion D. Moderating effect of social support on the stress-burnout relationship. J Appl. Psychol. 1984; 69:615-622)

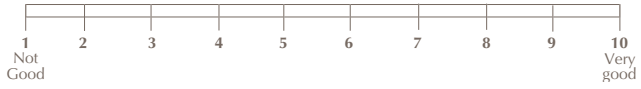
In my work (in the last 4 to 6 weeks):

1. I feel overloaded
2. I experience competitiveness
3. I feel not worthy
4. I have difficulties in decision making
5. I have impossible duties and responsibilities
6. I feel overextended in terms of deadlines and obligations
7. I have conflicting demands

Life and job satisfaction

Three questions on a scale from 1 to 10, (from Strauss-Blasche, G., University of Vienna, 2003)

Rate on the scale your current:

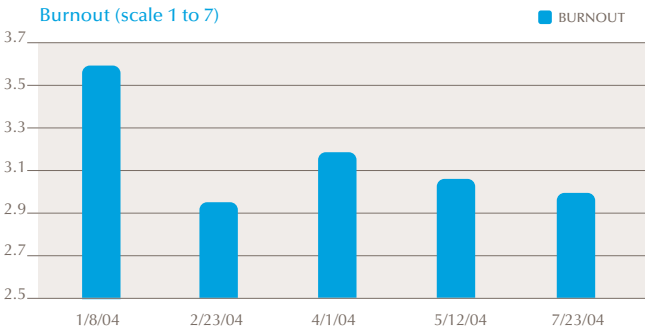


1. Life satisfaction
2. Job satisfaction
3. Well being

PSYCHOLOGICAL MEASURES, RESULTS

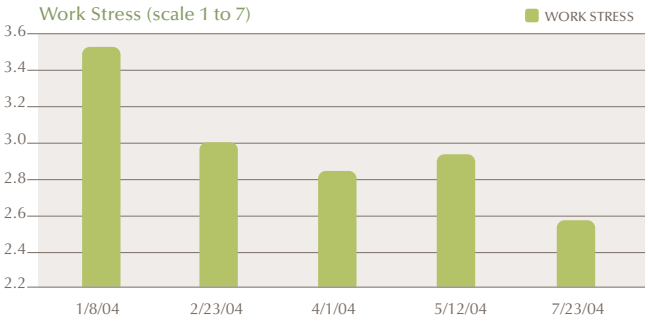
Burnout

The test group shows a decrease of the burn out rate of 14% to 22% when compared to itself, starting with the first data point.



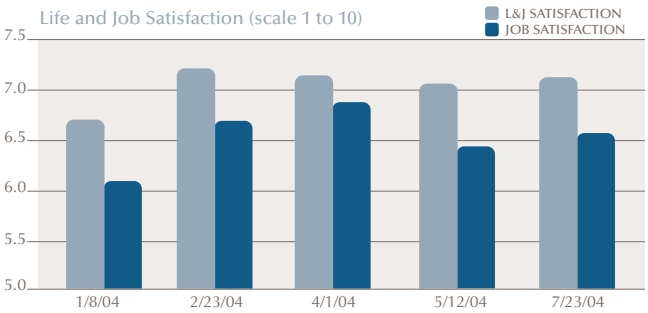
Work Stress

The test group shows a decrease of the subjective work stress feeling of up to 38% when compared to itself, starting with the first data point.



Life and Job Satisfaction

The test group shows an increase in overall life and job satisfaction of 5% to 7% and an increase in job satisfaction of 6% to 12% compared to itself, starting with the first data points.



Return of Investment, Study design

A test group of users of Optimal Office was chosen from volunteers out of about 63 workers. The test group, which was given Optimal Office and from which productivity data could be obtained, had 8 members. They worked at computer workplaces in a cubical office environment, at least 5 of 8 hours at the computer, in tasks requiring at least occasional use of the mouse. The members were all female, age 22 to 50, average 35.3.

PRODUCTIVITY MEASURES

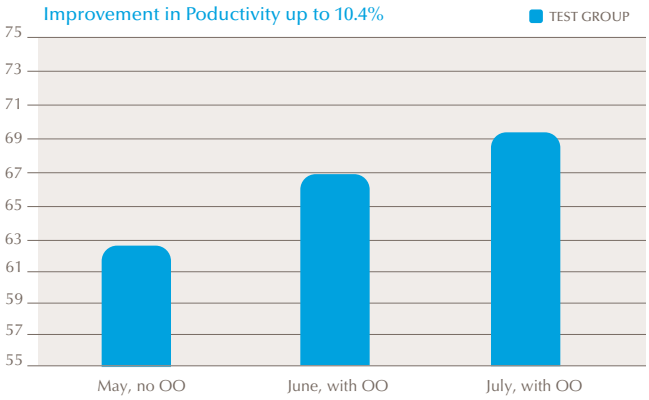
Internal productivity measures were collected, starting April 26th 2004. They describe "work items finished" per day and are tasks like reviewing a bill or correcting an account, since this was a regional billing office of Aurora.

On May 12th 2004 Optimal Office was installed on the workplaces of the test group and a one-hour introduction and training into the Optimal Office device and program as well as a questionnaire assessment for burnout, work stress and life and job satisfaction were conducted. The test group used the device until August 2nd 2004 and the productivity measures have been collected during that time.

PRODUCTIVITY RESULTS

The increase in productivity in the time where the test group used Optimal Office was 6.9% in June and 10.4% in July, compared in the time before where they did not use Optimal Office.

The average increase in productivity was 8.83%.



RETURN OF INVESTMENT CALCULATION

Assumptions

COST OF WORKPLACE		PER YEAR
compensation		$25,000.00
benefits	18.0%	$4,500.00
overhead	30.0%	$7,500.00
		$37,000.00
PRODUCTIVITY INCREASE	8.83%	
WORKPLACE COST REDUCTION PER YEAR (assuming no profit increased)		$3,265.77
COST OF OPTIMAL OFFICE APPLICATION		
device and service		$270.00
work hours for training	2.0	$20.56
overhead		$10.00
Sum		$300.56
Return of Investment after one year		**1110%**

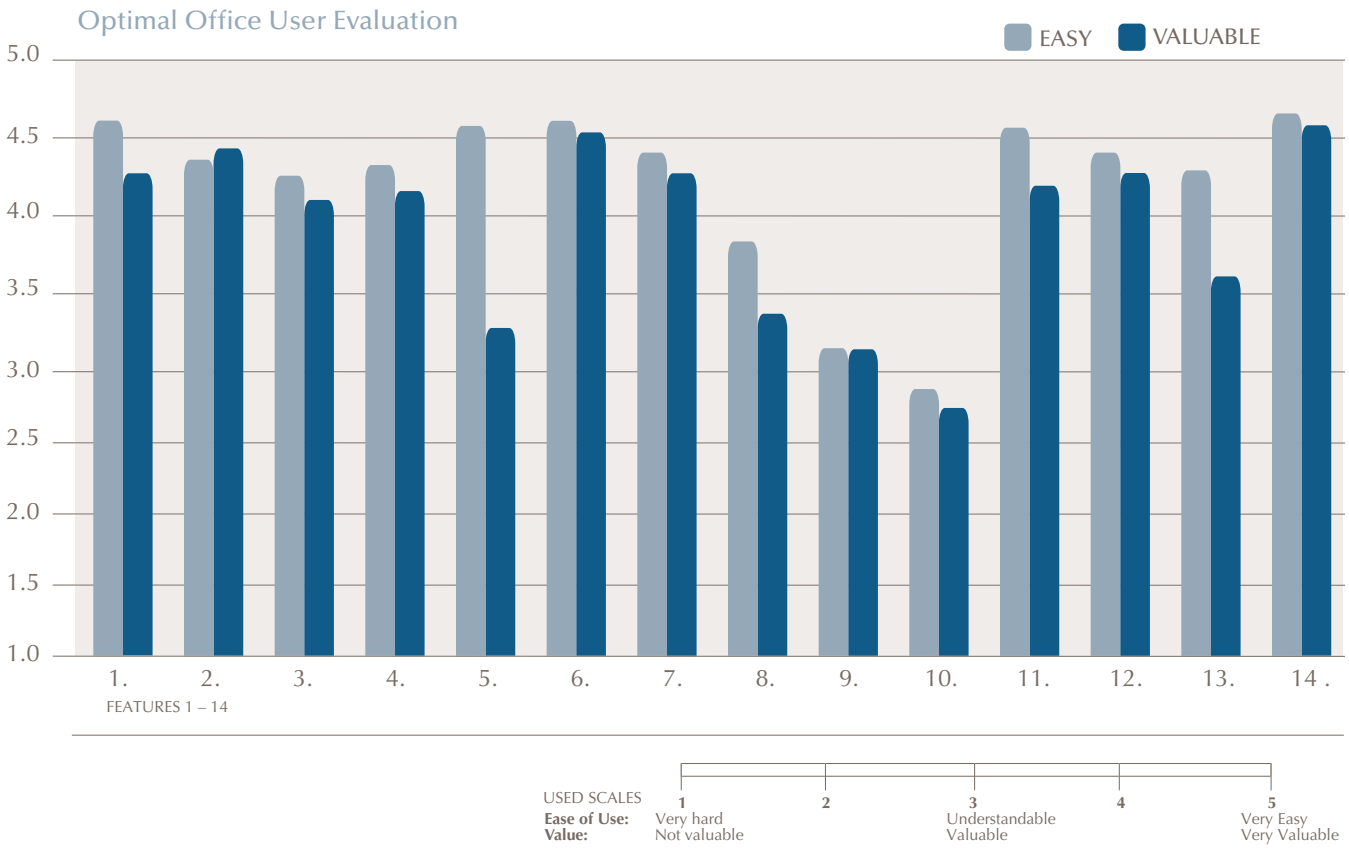
Ease of use and Value, Study design

Six weeks after installation, 11 users were given a questionnaire to evaluate features and trainings of Optimal Office. The average score for ease of use was 4.36 (87%), the score for valuableness 4.08 (82%) on a **scale of 1 to 5**.

Evaluation Optimal Office V 1.2

FEATURES 1 – 14		EASE OF USE RATING	VALUE RATING
1.	Tray Icon	4.6	4.34
2.	Data value	4.4	4.5
3.	Side Bar	4.2	3.6
4.	Threshold PopUp	4.3	4.2
5.	Schedule PopUp	4.5	3.3
6.	Biofeedback	4.7	4.5
7.	Soccer	4.4	4.3
8.	Review of the day	3.8	3.4
9.	Review of the week	3.1	3.1
10	Review rewards	2.9	2.8
11.	Three Breaths	4.5	2.8
12.	Stretching short	4.4	4.0
13.	Stretching long	4.3	3.6
14.	Relax Journey	4.7	4.6
Median		**4.36**	**4.08**

Billing Dpt. Aurora, WI, February 2004
11 users, female, average age 42.2



QUOTES BY USERS OF OPTIMAL OFFICE

January to May 2004 – Impressions and quotes from users of Optimal Office and the department management after 3 months of a case study at the billing office of Aurora Healthcare, Sheboygan, Wisconsin.

- "The productivity of the department has gone up during the three months people use the [Optimal Office] Stressmanager." (Anecdotal remark of the management (later confirmed by the Return of Investment study.)
- "I find that it works for me by reminding me not to blow things out of proportion."
- "I really like the soccer game. It feels like it is mind over matter."
- "It makes me think about the stress. Sometimes the stress can be really high and I don't even realize it."
- "You learned at our last meeting that those of us with the Stressmanager [Optimal Office] mouse did not want to relinquish it.The prompts and the measurements have provided constant guidance and we have come to rely on them to help us through the day."

COMPREHENSIVE NOTES OF A CASE STUDY MEMBER

Subject: Thoughts on the first phase of the Stressmanager [Optimal Office]
To: chris@stressmanager.info
From: madeleine.tribbick@aurora.org
Date: Wed, 7 Apr 2004 07:37:40 -0500

Good morning, Chris.

Here is a synopsis of my reactions to the first phase of the trial: I was surprised how sensitive the measurements were. I had a fair idea of when I was stressed, but next to no awareness of the steps that led up to it. I think that this is an important aspect of the Stressmanager [Optimal Office], the fact that one is alerted to an impending problem.

As we discussed earlier, I had a little trouble getting used to the mouse, since I used to hold it differently. I think that adjusting to the sensor has improved my grip and lessened wrist strain.

It was easy to use the breathing and stretching exercises and the photographic sequences and to see their impact. It was harder to play the soccer game and to take the biofeedback training. I think this is because people that are easily stressed can be compulsive, driven and highly focused. The effect of intense focus in me is probably to raise my adrenaline level, judging by physiological response, and to concentrate on something whose aim is to relax is to unlearn many years of habitual reaction. I continue to work on this and think it is the most useful part of the training in the long term.

The end-of-day and weekly reviews are instructive. Many of us leave without assessing our workday, except in our employer's terms. The review provides a different and personal assessment. Most of our behavior is unconscious and unconsidered and this conscious reminder is salutary.

You learned at our last meeting that those of us with the Stressmanager [Optimal Office] mouse did not want to relinquish it. The prompts and the measurements have provided constant guidance and we have come to rely on them to help us through the day. After consideration, I conclude that this is not only because of the reduction in physiological stress, but because the Stressmanager [Optimal Office] provides a sense of control in jobs that frequently lack it. I recall reports of experiments with rats, in which rats that were stressed but had a measure of control retained a reasonable state of health. The rats that were stressed with no control over their surroundings exhibited poor physical and psychological health, gnawing their fur off and biting the other rats. It does not matter whether control is real or illusory; it is the sense of it that is important. The jobs of my co-workers have not changed and there are aspects of the oversight of their work that I consider to be intolerable, but when their hand is on the Stressmanager [Optimal Office] mouse they can be in control.

I am sure that there are some omissions, but hope that this is useful.

Madeleine T.
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(920) 459-1134 Ext. 6500

Added comments May 4th 2004:

Doing the exercises, mild as they are, can have a beneficial physical effect. I was very reluctant to do the neck exercises because of damage from injuries, but decided to try them for the sake of the program, albeit very gingerly. I have managed to add about 7 degrees to the range of motion and hope that the improvement continues. As the Scots say, many a mickle makes a muckle, i. e. small things add up.

APPENDIX

Description of Optimal Office V 1.2

Optimal Office consists of a special computer mouse and software for the PC. The mouse works like a standard PC-mouse and in addition has sensors, which register physical data.[1] These readings are displayed as they occur on the PC, whenever the hand grips the mouse and uses it normally.

Display Options

The software program generates a direct feedback with the measured data and teaches popular, basic skills of stress management over time. It incorporates inconspicuous stress level indicators and scheduled stress reduction trainings. A slender bar on the side of the screen, a tiny icon or a number can be selected to display the user's stress level and its trend whenever the mouse is in use. These guides make the user aware of stress objectively.

Trainings

When a threshold of stress is reached, a cue alerts the user. A short training such as three deep breaths or a brief stretching session is offered. The user is prompted to release stress as it arises, thus preventing its accumulation and associated ill-effects.

[1] It measures the skin conductance level, a physiological measure reflecting the level of stress.

The training program includes a scheduler that brings up guided relaxation sessions two or three times each day.

The total training time is 6 to 10 minutes a day. The trainings enable the user to cope with stress at the workplace, while remaining seated at the workstation. They are designed as short breaks within the workflow, to release stress in the body for a fresh start. Training options include guided breathing exercises, stretching, viewing relaxing picture series, biofeedback, and a biofeedback soccer game.

Review

A review shows the stored data, notes and time markers from a workday to evaluate the progress in stress management. Privacy is ensured by a password.

It measures the skin conductance level, a physiological measure reflecting the level of stress.

Description of the target PC-Systems

- Windows 98SE onwards
- 800x600 screen minimum
- 1 free, available 9pin serial port for the biofeedback data to be received
- PS/2 port for the 2 button 1 wheel mouse with a standard driver
- Multimedia is used for the stress management. Ideally the PC has a sound card and speakers or headphones to play wave-files. The program needs working codecs for .avi and .wav.
- A local C:\ hard disk with 50+ MB free storage room. The program is copied into a folder, so a CD-Rom drive or a network to copy it and for service (data access for the study) is needed. The program starts from the autostart folder and has a desktop icon, it is strictly local, not needing a network to run.
- Ideally users have a local email program through which they can access the support.

Description of the Sensor Mouse Device

The equipment consists of a mouse with 2 buttons and one wheel with stress monitoring sensors, a box in the mouse cable for the circuitry and 2 cables to be plugged into the PC.