

Workstation Assessment

New Leaf Inc. is a systems development company based in Burlington, Massachusetts. Recently, the company hired a new director of human resources and, as part of the director's employee wellness initiative, she has requested workstation assessments for all employees. Due to the nature of its business, New Leaf employees spend long hours in front of their computers. A significant number of senior employees travel to customer sites around the country regularly, and for this reason almost all employees use notebook computers instead of desktop computers. Approximately half of the staff work in offices and the rest work in cubicles. Additionally, due to the expertise required of its workforce, the majority of employees have 20 or more years in their field. The following is the workstation assessment for Kevin Smith, Director of Engineering for New Leaf:

Workplace Assessment for: Kevin Smith, Director of Engineering, New Leaf Inc.

Assessment conducted: November 18, 2011

Address: 168 Middlesex Turnpike Burlington, MA 01803

Interview with workstation user: Kevin Smith said that he often has shoulder pain, which he attributed to general stress and not to his workstation. In the past he has had occasional acute back pain. He noted that he tends not to sit at his desk with both feet on the floor but tends to cross his ankles and sometimes his legs. He mentioned that he used to have a more standard office chair that was too small for him, but when New Leaf closed a satellite office, he secured one of the taller chairs from a former conference room, and this fits him much better. (Kevin is 6'3" tall.) Kevin travels frequently, approximately 50 percent of his work time. In addition to securing the chair, to make his office more comfortable, he also has an up-lighter lamp that he uses along with the overhead fluorescent lights. He shares the office with one other person. The office is approximately 12 feet by 20 feet with a central window with vertical blinds that can be used to block solar glare. Kevin has not complained about his office or workstation. When pressed as to whether some of his physical ailments might be because of the set up, he said he has adjusted to it but conceded that some of his back problems might have been due to slouching in his chair, curling his lower back.

Evaluation Checklist

Working posture and movement:

- The current set up does not allow for a neutral joint position in the back or wrist.
- With the notebook computer placed in its usual position on the desk in front of Kevin, he tends to lean forward and look down to view the screen.
- There is a larger monitor on the desk, to which Kevin connects his notebook computer to extend his screen area. The screen is positioned to the right of center and this forces him to turn his neck to the right to use it. Kevin said he is fine with this positioning, and does not feel it affects his comfort level.
- The monitor is positioned to the right because the base is too big to enable the monitor and the notebook computer to be on the desk one behind the other. Also the notebook computer screen would obstruct the view of the monitor. To put the two pieces of equipment together in order to enable a straight-on alignment, the notebook computer would need to be too close to the edge of the desk or there would be a risk of pushing the monitor off the desk.
- Kevin does not have a notebook computer docking station

Chair:

- The chair height is adjustable, but needs to be at its maximum height of 19" to be a good fit for Kevin.
- The seat is 19" from front to back and has a waterfall edge. It has firm padding and is in leather. Kevin said he is comfortable with the seat length, which leaves him about two inches free before his knee bends, and finds the cushioning to be comfortable but not too soft.
- The chair does not have lumbar support, but it is firm and fits Kevin when he moves all the way back into the seat. Sitting naturally on the chair Kevin tends to curl the lower part of his back in a slouch.
- The chair theoretically has an adjustable torsion element that adjusts the amount of rocking spring, however this is non-functional and leaves the seat with a set, forward tilt-angle. Thus, to sit completely back in the chair Kevin needs to push himself back and be aware of how he is sitting. The chair still has a limited rocker motion.
- The seat does not adjust pelvic angle, but Kevin said its current fixed setting fits him comfortably.
- The arms supports on the chair are not adjustable. Kevin can comfortably rest his arms on them.
- The base has a 5-spoke assembly and is on wheels to enable mobility
- Kevin can sit in a 90-90-90 position but tends not to do so. He attributes this to bad habits rather than the chair.
- The chair does not have a separate seat and backrest, so the back of the chair moves in coordination with changes in the seat height.

Work surface:

- The desk height is 30". A standard office chair would fit under the desk, but the standard office chair that New Leaf uses does not elevate to a seat height high enough for Kevin.
- The desk length is 72" and the depth is 36". There is plenty of work-surface area, and Kevin finds it generally comfortable. However, as there is little fixed storage space in the

office, Kevin finds he uses up a lot of the work area with multiple piles or papers required to manage his different work projects.

- The desk has no center drawer, and this is good because otherwise Kevin would have difficulty getting his legs under the desk.
- The desk surface is non-glare.
- Due to the office arrangement, there is only just enough room to push the chair back to stand up. As a result, Kevin usually swivels the chair before standing.

Computer:

- Kevin uses his notebook computer's keyboard and tracker pad. He does not have, nor does he wish, to use an external keyboard or a mouse.
- The keyboard is flat, and not sloped. Kevin reported having used laptop and notebook keyboards as he has for more than a decade and he does not have and difficulty with it. He does not have any pain, stiffness, or numbness in his hands, and he finds it convenient.
- The keyboard provides tactile and auditory feedback.
- The keys are sculpted.
- The tracker pad is adjusted to Kevin's choice of sensitivity and cursor speed.
- It is a QWERTY keyboard.
- The non-glare screen was special-ordered by user when computer was purchased. Kevin has set the illumination to his preferred level.
- The screen is 17" and its angle is adjustable.

External monitor:

- Kevin often uses both his notebook screen and his external 25" display screen at the same time. This enables him to have several windows and applications open and visible at the same time. Kevin also uses the feature of displaying the same view on both screens so he can use the notebook and turn the external monitor around for a guest to look at while they collaborate.
- The computer screen and the monitor screen do not have the same aspect ratio. This means if Kevin has a full-screen window open on his computer and wants to have it visible on the external monitor, he loses several inches from the bottom of the window. Kevin has adjusted and now uses a reduced window-size at all times on his notebook computer, in order to not have to adjust window-size when switching between the two screens.

Computer accessories:

- The computer power adapter and cord is transportable.
- The power adaptor cable is too short. It neither comfortably rests on the desktop nor reaches to the floor. Consequently, this applies tension to the power socket on the notebook computer.
- Outlets in the office are by the side of the desk and readily accessible down the side of the desk where a 4-way fused power strip distributes power to Kevin's other electronic devices.
- Unlike some computers that have a magnetic release for the plug from the computer, for both safety and to avoid pulling computer to the floor by accident, Kevin's computer is not so adapted. However, there is no danger of tripping while at the workstation due to the short cord and the arrangement of plugs this requires.

Storage:

- Kevin finds he is short of storage space. His bookshelves have been filled for a number of years with resources he is required to keep.
- The desk has two desk drawers and two filing draws. He has no lockable storage space.
- Between Kevin's desk and his coworker's is a table. It holds a rarely-used color printer, and a local server, monitor, keyboard, and mouse. It can also be used by visitors to the office.

Telephone(s):

- Kevin's office phone has a cord. It easily reachable from seated position.
- The phone has a standard handset that is not suitable for extended use as Kevin often needs. Kevin often needs both hands to type and would crick his neck to hold the phone to his ear.
- The phone is capable of hand-free speakerphone usage, but is only a half-duplex—which means sound only goes in one direction, so if Kevin is speaking and the person on the other end speaks, they cannot hear what Kevin is saying. Therefore, Kevin regularly needs to move to hold calls in conference rooms that are equipped with full-duplex phones.
- Kevin also uses a mobile iPhone. He does not usually charge it at work.

Lighting:

- The office had good daylight due to a large window. The window has a shade to enable adjustment for glare.
- The office has good overhead fluorescent lighting.
- Kevin additionally has an up-lighter lamp rated at 150W but currently holding a 40W incandescent bulb. The uplighter is used more for ambience, as it softens the fluorescent light, than for work.

Air:

- The entire office building is climate controlled. There are several zone thermostats, but these cover large areas, which often vary in temperature. Thus, it can be that some rooms are often cold while others are hot. Kevin's room is usually at a comfortable temperature both in the height of summer and the depths of winter.

Noise:

- Room is very quiet.
- Kevin shares the room with one other colleague, and between them they manage their interruptions, making use of a nearby conference room for most conversations that do not include the both of them.

Wiring:

- Kevin's computer adapter and cord fits into the left side of his computer and so needs to stretch around the computer to the extension outlet on the side of the desk.
- Extension outlet, with additional extension outlet, controls external monitor, external disk drive, speakers, and printer.
- There are only two outlets. One is behind Kevin's chair and not use for safety purposes.
- Kevin commented that since he is able-bodied, he has not problem accessing the various plugs as necessary.

Recommendations:

Summary: Kevin's chair should be replaced. His desk surface should be raised. His telephone should be changed for one that fully supports conference calls. Have Kevin consider using a docking station and monitor mounting to minimize postural adjustment needed. Increase light bulb brightness.

Chair:

- Get Kevin a new chair that is appropriate for his height. A chair with a seat that is 19" high and a back to front measurement of 19" to 20" with a waterfall front is appropriate. However the chair should also have adjustable seat height, backrest height, lumbar support, pelvic angle, and arm support. Example: Comfort Series 24-Hour High Performance Chair – Leather (Ergo In Demand, 2011)
- Alternatively, as Kevin likes his current chair, and it seems to fit him, getting the torsion control for the front/back position fixed would also be possible, although it does not provide separate seat and back height adjustment.

Reasoning and explanation: It is important that Kevin be able to adjust his chair, so that the chair is adjusted to Kevin instead of encouraging Kevin to conform to the chair, which is the current case. Currently, Kevin's chair seat leans forward and makes sitting back in the chair and upright an effort. By not being able to sit appropriately, Kevin is putting a strain on his lower back and sitting in a bad posture. To offset the slouch brought on by the chair's broken seat torsion, Kevin occasionally sits on his foot and leg, to take the pressure off his lower back. Sitting in a lop-sided position can also cause long-term misalignment of the body.

Work surface:

- Kevin's work surface, or desk, is too low. The desk needs to be raised by 3". As his present desk does not have separate feet, which would allow raising it on permanently affixed blocks, it may be easier, and safer, to get a new desk. There are a number of desks available that have adjustable-height tops.

Reasoning and explanation: Kevin had adapted to the current height of his desk. Previously, he found the surface too low, but as he could not think of a safe way raise it, he has adjusted to working with it as it is. The desk does not allow Kevin to sit in a neutral posture, with shoulders back and arms at 90°, and so he leans forward to work. Having a chair that meets his seat-height requirement, he is unable to bring it as close to the desk as he would wish, as exhibited by the torn and scraped leather arm rests. A higher desk should enable Kevin to position himself comfortably and properly to work at his desk, and lessen the degree to which he bends forward while working.

Telephone:

- Replace the half-duplex phone with a full-duplex conference phone.

Reasoning and explanation: While Kevin, and his officemate, are careful to take conference calls in other rooms so as not to disturb each other, they rarely find themselves in the office at the

same time and it would be more convenient for each to make conference calls from their own phone, instead of needing to walk around the building with their laptops and cords seeking a conference phone. If Kevin uses his own speakerphone, he cricks his neck and need to pay attention when he and the others speak. Being able to work in one's own office with the same tools provided in other rooms would eliminate wondering around the office carrying a computer and increase both comfort and the ability to interact with clients.

External display:

- Recommend consideration of use of an external monitor mounted on an extendable arm or finding one with a smaller base and adjustable height. This would enable placing it in a more comfortable straight-on alignment.
- A notebook docking station might make the wiring connections between the wall, the monitor, and an ergonomic keyboard more convenient when moving to and from meetings with the notebook. This would enable a more permanently configured office environment with a simple means to connect and disconnect his notebook.
- When Kevin's external monitor is replaced, it would be good to find one that can be adjusted to having the same aspect ratio and height. This would enable more comfortable logical screen extension.

Reasoning and explanation: It would be good to have the two screens have the same aspect ratio, as Kevin is losing some of the benefit of having a 17" large-screen notebook because he needs to adjust to a smaller window-size in order to allow compatibility between the two screens. Since Kevin uses both his notebook and external display screen simultaneously, he said he would find it distracting to have both straight in front of him. While Kevin has adjusted to having the external monitor being on the right side on his desk, it still requires he look in this direction. Having a monitor on an extendable arm would allow change in position so he is not always turned to the right.

Lighting:

- Consider increasing the wattage of the bulb in the up-lighter to enable it to be used for workstation lighting.

Reasoning and explanation: As Kevin considered the lighting in the office, he realized that he only used the up-lighter for ambience because of its low-wattage bulb. Having a brighter light might enable him to use this lamp as an alternative to using the stark overhead lighting all day. He could use the up-lighter to supplement the natural daylight.

Wiring:

- Wind up each individual cord to an appropriate length and secure with electric ties. Organize the plugs in the extension plug, so that the items most often removed are closest to Kevin's side of desk for easier access.

Reasoning and explanation: The current wire arrangement is disorganized and could be unsafe should someone be working on at the extra table or opposite Kevin, as his described sometimes happens. It is also a potential hazard for the cleaning staff.

Storage:

- Add a two- or four-drawer filing cabinet at the side of Kevin's bookcase.

Reasoning and explanation: While Kevin's work requires the regular use of project documents, he would not necessarily keep all of them on piles on his desk, given a choice. Additionally, the project work is occasionally confidential and so it would be good to provide a lockable storage capability.

Appendix

See attached photographs of the office workstation

Reference

Ergo In Demand (2011). Adjustable Laptop Riser Stand. Retrieved from:

<http://www.ergoindemand.com/adjustable-laptop-riser-stand.html>