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SpeakQ

SpeakQ is a plug-in for WordQ that adds forgiving speech recognition functionality. It is the only speech recognition tool designed specifically to make writing easier for those that find writing too difficult or frustrating.

Word prediction, spoken feedback and speech recognition work cooperatively and are integrated seamlessly. This interaction has proven, for many, to be more useful than the sum of its parts. Writers fluently and quickly switch between using the keyboard, the word prediction and dictating the words they want. Some use the speech recognition only intermittently, while others use it most of the time. Many writers have come to call it speech recognition on demand, which describes how they use it only when they want it.

Speech recognition is integrated so tightly with word prediction, it is a new hybrid we call "speech enabled word prediction". When a writer says a word or phrase into the microphone, the program provides predictions and options of what it thinks was said. The writers can then choose what was intended. The writer doesn't need to speak perfectly, nor does the computer have to recognize perfectly, because the predicted options help compensate for any imperfections.

Speech Recognition. An introduction.

Almost too easy

Many writers, parents and teachers mistakenly believe that speech recognition will make all kinds of writing problems go away, and it is understandable why they would. Blame it on Star Trek. Thanks to Jean-Luc Picard and his crew, people readily understand and envision what it is like to talk to a computer. They imagine a program that writes what you say, making writing almost too easy.

Professional dictation programs like Dragon Naturally Speaking have been very effective in meeting this demand. They are designed for doctors, lawyers, professors, and business professionals who are burdened with the slow and tiresome task of paper work, which is possibly causing them Carpal tunnel syndrome. Many of these users boast the ability to dictate paragraphs quickly and accurately.

Some how, well meaning people concluded that if professionals can use Dragon to avoid typing, then surely anyone could use it to avoid spelling. While it does work very well for some, many people are finding that even if a struggling writer can speak well enough to use it, it doesn't allow them to improve on their weaknesses.

Additionally, it takes a lot of mental planning to dictate a well pronounced, fluent, grammatically correct and complete sentence - let alone several sentences; or a



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paragraph. Dictating is work, and to do it fluently requires thinking, smooth speaking, and proper sentence construction at the same time. For many, it is much harder than it seems. Some writers cannot pronounce words perfectly, others have a loose understanding of grammar, and even more writers struggle with getting the proper rhythm and flow of a sentence.

Most speech recognition programs create errors from incorrectly recognized speech, which are invisible for writers that have difficulty reading. Grammar-check can't find these errors because what is written is nearly always correct in one context or another. Spell-check is no help either because only improperly spelled words are highlighted, although it may be the wrong word for the sentence.

If a writer has difficulty reading, these mistakes are camouflaged, and they are unlikely to find them.

Set up to fail

Unfortunately many writers are set up to fail with speech recognition. The story is always the same, be it in the classroom, in the work place, or at home. Someone invariably tells the writer:

"You know how spelling is hard for you? And you know how it takes you so long to write? Well you can speak and the computer will listen to you and do all the writing for you! Isn't that great? Just imagine how your writing will improve!"

Unfortunately, the writer is setup to fail. Expectations are now unreasonably high. When the results are not as promised, the writer has to either dismiss both the software and the promises as a lie, or, conclude, "I can't spell or write, and now according to this thing, I can't even speak properly". What was touted to be the solution, turns out to be yet another strike against the writer's self-confidence.

The Search for an Alternative: Enter SpeakQ

Having seen one program fail, people start looking for alternative software that might work better. Teachers, parents, colleagues, friends, specialists and others join in the search. Eventually, someone finds SpeakQ. But, they are still expecting to find a tool that allows a river of pages to flow directly from the struggling writers mouth. SpeakQ cannot do that either. We have yet to find a tool that can. What SpeakQ can do is to provide the tools for the writer to find accomplishment at every step in the writing process and help them prevent, find and fix their own mistakes.

SpeakQ: Instructions for getting you started

Even if you are most interested in SpeakQ, start with WordQ. Because of the way SpeakQ is integrated into WordQ, writers need to be fluent and confident with



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WordQ. Stated again for emphasis: if you don't know how to use WordQ, you will not understand how to get the most out of SpeakQ.

Before getting started, consider the sounds in the environment around where you'll want to be using SpeakQ. The program will try to listen to your voice. Unless you have a noise-cancelling microphone, background noise can be a factor in the program's ability to recognize you. Some kinds of noise are more problematic than others. A single conversation taking place nearby is probably the biggest challenge, because SpeakQ will have difficulty separating your voice from those in the conversation. Fans, air conditioning, and the murmur of multiple conversations on the other side of the room are often interpreted as white noise, which is less problematic because it is consistent. Therefore, a quiet classroom with one or two loud voices can be a more difficult environment for the microphone than a busy classroom. Anywhere people tend to converse, listen to music, watch TV, and use the phone can create too much distraction for both you and the microphone. Sometimes the best option is to move the computer to a less busy location or put up a barrier.

Microphone

Microphone choice is important, and a poor quality microphone can stop things before they get started. A \$2 microphone will give you \$2 quality. At the same time, the best microphone can't perform miracles. Dictation is work, and there are techniques to making speech recognizable. Be sure to read more about these techniques in the discussion below about the importance of playing with the voice recognition, first, to learn how it works.

Headset microphones are better than tabletop microphones. They allow you to maintain a consistent distance between your mouth and the microphone, which is critical. Even the best tabletop microphones are rife with challenges for speech recognition. If you move closer, farther away, or change the direction of your head while speaking, it will affect performance. But with a headset, the microphone's distance from your mouth will remain constant, as the boom holds it there.

Find a headset with a stiff, sturdy boom. This will keep the microphone in the same place, which will help with consistent recognition. A flimsy, floppy boom can allow the microphone to fall towards the writer's throat or bounce and vibrate a lot. The microphone can pick up these vibrations as background noise, and negatively affect recognition.

Bluetooth headsets aren't a good choice to work with SpeakQ. To conserve on battery life, it is common that a Bluetooth headset remains dormant when not in



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use. When the computer activates the microphone, the headset will take a second to engage, and then make a chipping sound to indicate that it is "ON" and a similar sound is made when it is deactivated. This only works if you are turning the microphone on and dictating for 5 minutes at a time before turning it off. Most SpeakQ users use the microphone intermittently, turning it on and off between words or phrases, using it several times in a sentence. Some SpeakQ users find the time delay before the headset engages prohibitive, and the chipping "ON" and "OFF" sounds distracting. Also, you should consider that it could get lost or stolen easily in classrooms and public places.

Headsets with noise cancelation technology are a big plus, and for many users it will mean the difference between successful use of the program or not.

Look for a headset that has a speaker for each ear. Consider that many writers use WordQ's speech feedback while they are typing and for proofreading. A speaker over each ear makes it much easier for you to identify errors. Also, writers with attention and focusing difficulties often say that this can help to drown out distractions.

Connection types: USB, Analog, and Adapters



USB Headset

Some headsets come with USB connections, while others have two traditional mini-analog connections. USB connections promise higher quality sound and microphone performance. They often use something that is more or less like an external sound card, which improves the signal to and from the headset. The disadvantage of these is that the computer needs to control the headset at a hardware level. While plugging and unplugging them periodically isn't a problem, if it is done too many times the computer can get confused and could stop handling sound entirely. If this happens, it can mean resetting the control panel, and sometimes rebooting. Also, USB connections may not be available on older computers.



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Analog Headset

Analog connections, however, are much easier to locate. They have two jacks: one for the speakers of the headset, and one for the microphone. Some have great sound quality and are on par with their USB counter parts. At the same time, some are so cheap that they are useless for speech recognition. You really do get what you pay for. Consider purchasing from a store that has a 30-day money back guarantee. Analog connections never have a problem with plugging and unplugging, like USB connections. Professional trainers of WordQ+SpeakQ appreciate that it is easy to plug in the microphone, while leaving the headset speakers unplugged, so sound remains directed to the computer's usual speakers. This allows writers to speak into the microphone as they normally would, and then all present can hear the speech feedback and coach the writer accordingly.

USB adapters are another item worth considering. They allow analog headsets to plug into them for better performance. In many ways these enable the best of both worlds. Some adapters offer a much higher quality of audio technology than the computer's sound card. When an adapter is plugged into the computer's USB port, it acts as a second sound card. An analog headset plugs directly into the adapter, which can make a good microphone even better, but it cannot do much for a poor microphone. Sometimes, these USB adapters are included with a headset, but usually the best ones need to be purchased separately, and are an added expense.

For your convenience, we provide headsets for purchase. These are the same headsets used by our developers in creating WordQ+SpeakQ. You can find them under the header Microphones from the home page at www.goQsoftware.com

Setting up the Microphone

Having correctly connected your microphone, you will first need to create a user name for your speech recognition profile.

In the WordQ+SpeakQ toolbar, go to: Options/Speech Recognition/New/ Enter the Writers Name and click "OK"

WordQ may take a moment, and then it will start the Configure Microphone Wizard. If it doesn't, go to: Options/Speech Recognition/Configure Microphone. Configuring



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the microphone is NOT training. This is merely setting the sensitivity of the microphone to the volume of the writer's voice.

Doing this step poorly or improperly often results in poor recognition and/or recognition failure. If you experience a drop in speech recognition performance, try configuring the microphone again. If you change environments or the acoustics of the room change, you may need to reconfigure the microphone¹. It is often the fastest way to revitalize good performance.

¹ An empty room will have different acoustics than a room full of people. Even if they are perfectly quiet, their clothing can absorb a lot of sound and change the acoustics of a room. Most kinds of fabric are good at absorbing sound, and for this reason drapes being open and closed alter the room's acoustics and possibly the performance of the microphone. Open and closed windows and doors can change the amount of background noise, affecting the room's acoustics. In all cases, often the easiest and quickest fix is to reconfigure the microphone before reconfiguring the room.

Struggling readers should not read the sentences provided. The voice of a struggling reader, while reading, is completely different from their normal voice. This voice is often shy and quiet, and readers often stutter while trying to read and pronounce words. Stop where SpeakQ asks you to read: "I am using the Microphone Wizard. It is adjusting the volume of my microphone." click on the back button, and do the following.

Since SpeakQ is only looking for a sense of the volume of the writer's voice, the writer can learn and say something like the following:

My name is _____.

I go to _____ school or I work at _____.

I am ___ years old.

Or you can even have them sing the Alphabet song:

"A-B-C-D-E-F-G,

H-I-J-K-L-M-N-O-P"

The only thing that matters at this stage is that they say something that sounds like it could be fluent sentences, in their normal voice.

Be sure that you are not holding or touching the microphone while using it. Even if held perfectly still, this will cause slight vibrations that the microphone hears as enormous sounds. If the microphone is held during the configuration process it may



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negatively affect all future microphone performance until you reconfigure the microphone.

Don't Train Right Away-Play!

Train the writer before training the computer. Writers train SpeakQ right away, but they don't have to, and for most it isn't a good idea. It is often better to use it without training first, even if only for 5 minutes. Many writers are understandably excited to get started, and will quickly learn a lot about the technology by playing with it. Try speaking in slang, funny voices, accents, and make up words to see what happens. This is all very valuable learning and it is encouraged. Writers will quickly learn the technology's limits and requirements. 1) It only recognizes real words. 2) Work is required of writers to make themselves recognizable.

The Importance of Play

If not given the time to play and experiment, younger writers will often try to learn the limits and requirements of the technology during the training process. When the program is trying to make generalizations about their voice, many younger writers are unknowingly hindering the process. Their attempts with funny voices and accents are being considered and calculated, and SpeakQ will get confused. Training requires consistency. If learners are given the time to play and learn about the limitations and requirements of the technology, then they can focus on making themselves recognizable during training.

There is another pitfall of doing the training first: it can set writers' expectations of success artificially high. "It was working so well during the training, why doesn't it understand me now?" The training is, by design, easier and more forgiving than when you are using the program normally. During the training, the computer knows and expects what words you are going to say, so it is easy for the computer to get it right. If writers can play with it before starting the training, then they can form realistic expectations.

Finally, playing with SpeakQ, before training gives writers the chance to compare performance before and after. This way, it is easy to recognize improvement. For example: When they were just playing around, the program may have only been working at 20% - 40% recognition. Yet, after the first session of training, recognition jumped to 70%. This makes it easy for writers to conclude that training was time well spent and that they should do more.

Things to Learn During Play

Teaching writers how to make themselves recognizable is easier than it seems.



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1). Writers shouldn't bother yelling into the microphone. If the microphone has been configured properly, then changing volume won't help.

2) Put - a - small - space - between - every - word. Before SpeakQ can try to recognize what is said, it first needs to identify the beginning and ending of each word. If you make it obvious for the computer, you will see a jump in recognition. Some writers that do this well don't need to train the computer at all. By contrast: Put-ting-spac-es-be-tween-each-syl-la-ble-will-re-sult-in-fail-ure. Remember the computer is looking for whole words, it cannot recognize syllables or phonemes. Ssss-oun-d-ing out a word for SpeakQ will not work, guaranteed.

3) Turn the microphone "ON" only when you know exactly what you want to say, then turn it "OFF" the moment you are done speaking. Using the F8 hotkey makes this easy. This step allows SpeakQ to hear only what is spoken. By not giving it the opportunity to consider background noise, this isolates (or frames) what SpeakQ should try to recognize. Often writers are slow to speak, or forget to turn off the microphone. SpeakQ may identify background noise and subsequently, add unwanted words or endings. Learning to turn off the microphone immediately after speaking can circumvent this problem. If SpeakQ seems to be adding the word "and" to the end of predictions, then the microphone likely needs to be reconfigured.

Is background noise going to be a problem? In almost every discussion about speech recognition someone asks about background noise, and rightly so. Yes, SpeakQ will try to recognize anything and everything it hears. If a door slams, or if a loud conversation is taking place nearby, recognition may be disrupted. However, background noise is often a larger problem when the microphone is "ON" and the writer isn't speaking. If you only have the microphone "ON" for the brief moment you're speaking, then background noise will have minimal effect. There is a Hot Key for the microphone that makes it easy to toggle it on and off, (F8). For more tips on managing background noise see the sub-section on noise-cancelling microphones.

Suggested Play Activities

Many writers will want to start to play on their own. Here are some guidelines and recommended things to try.

Don't introduce yourself to the computer. Often the first thing people try with all speech recognition tools is "Hello, my name is (fill in the blank). How are you?" Don't do this; it almost never works. "Hello, my name is" is so familiar and rolls off the tongue so easily, it is often said as a single word. Unusual names may also not be in the programs vocabulary of words, so there is no possible way it can recognize something it doesn't know. Words can be easily added, but the pronunciation of names often needs to be manually edited. Given that most writers are looking for



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success on their first attempts, this isn't a good place to start. Instead, they should try the following:

Try dictating individual large words, the larger the word the better. Writers should try saying words that they know, but that they can't spell. Create a list like below:

Dictionary Tractor

Thesaurus Gigantic

Encyclopedia Dinosaur

Psychology Tyrannosaurus

Nuclear physics Chemistry

Microbiology Stegosaurus

Large words have the benefit of sounding unusual and unique. They also have more parts for SpeakQ to consider when it is narrowing down the possibilities of what it heard. As a result, it is easier for the program to recognize larger words, and it can give the speaker an initial boost in confidence.

In contrast,

Next, try using several large difficult words at a time.

Such as:

Electrical Engineer (remember to speak with distinct spaces between words)

Assistive Technology

Phoenix Arizona

Federal Government

By having success with difficult words, skeptical writers can see that SpeakQ can help. At the same time, if it isn't working perfectly then putting in more effort to train it can be justified because there is some progress. With more training comes better recognition. It just takes time and patience.

Experiment with Smaller Words

Try speaking in phrases with smaller words, e.g.: "he hit the ball" "this is a test". Small words have the distinct problem of not having as many sounds that make them different from other small words. Speech recognition is most likely to fail on



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the simplest words, e.g.: "is" "the" and "it". To illustrate why this happens, think about how many words sound similar or could be confused with "ball": hall, wall, fall, doll, crawl, call, maul, all, awl, bald and even bowl. Now do the same with "Microphone" or "Technology": practically no words sound the same. On the up side, these small words are rarely the words that writers have difficulty spelling.

Many writers find typing small words to be fast and easy, and then they use the microphone when large and challenging words present an obstacle.

Troubleshooting

“If SpeakQ doesn't seem to recognize anything close to what I said; will it get better if I train it for weeks?”

If SpeakQ is failing miserably and never gets anything right, then training isn't likely to improve things. Most likely, you will need to re-configure the microphone. This is the simplest, fastest, cheapest option, and it is often the most effective. If the word "and" is added on to most of your recognition predictions, then is a sure sign that the microphone needs to be reconfigured.

Is the background noise the problem? This isn't always the case. If it is to blame, then SpeakQ should work sometimes and not others. But, if the background noise is constant, like an air-conditioner, a fan or a jet engine, then re-configuring the microphone should improve results. A noise cancelling microphone or adapter can also help in these situations. To be sure, if SpeakQ is failing all the time and the microphone has been re-configured in the current setting where you are working, then background noise isn't the problem.

“Do I need a better microphone?”

It could be the microphone, but generally, even a bad microphone still has some accuracy. It may only work 20% of the time, and be practically unusable for writing, but total failure is uncommon from a microphone unless it is broken.

“I have a laptop and it isn't working correctly?”

Modern laptops often have a microphone built into the keyboard or the frame of the monitor. Sometimes the computer gets confused as to which microphone should be used: the microphone in your headset, or the one built into the computer. To test this, reconfigure the microphone, and while speaking tap your laptop's keyboard. If this is the problem, you'll be able to see the volume indicator jump with your taps. To fix this you'll need to change the sound/audio settings in Windows' control panel, or Mac's system preferences. It can also be a good idea to double-check these settings. If your administrators have locked you out of entering the control panel,



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you may be able to fix this problem by rebooting with the headset plugged in. Hopefully, this will make the computer use the headset as the default.

Training

For most writers, SpeakQ generally works most of the time and training it to the writers' voice can improve this accuracy. Most writers experience the greatest improvement after 2 or 3 full-length training sessions. Training is easy and does not require any reading. The computer will read aloud first and the user will just need to repeat. Some writers never need to do the training. Others won't get very far without it. Don't train it too often, either.

Many people mistakenly think that hours and hours of training will improve recognition. In practice, this isn't the case. Generally, most writers don't need to do more than two or three training sessions to get a good sense of how to interact with the software. Further training will help, but it will not perform miracles. If after two or three sessions a writer's recognition has not shown a marked improvement, then refer to the trouble shooting section. Trials and demos are available online and in hard copy, so all writers can try out SpeakQ, before purchasing.

To start the training: Options/Train Speech

Options/Speech recognition/Train

Below are two things to consider when setting up and doing the training. Of course, be sure to read the instructions in the training, itself.

1. Selecting a Text

Before you can actually start the training, the first thing you'll need to do is select a training text. You'll have options: beginner, intermediate and advanced. These are not levels of difficulty; rather they are interest level. Beginner will have you read about cats and puppies or school yard stories, and advanced has texts about more mature topics like rebellion and science.

2. Redlight – Greenlight

During the training process, you may notice a traffic signal at the top of the window that changes between a red hand and a green walk symbol. These symbols change according to when you should speak. Understandably, if the computer were speaking when the microphone was listening, the computer would run the risk of training itself. When the red hand is showing, the microphone is "OFF", and when it is a green person walking the microphone is "ON" and listening.



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Sometimes, it happens that the first minute of training goes smoothly, and then quickly goes downhill. Why? We have seen this happen many times. In the beginning, many writers are getting the hang of it. Once they are practiced, they start to focus on the story and want it to go a bit faster. Then, they start speaking too early. The computer is expecting to hear the phrase from the beginning, but isn't. Understandably, the computer has trouble recognizing and requests the same words again. When this happens, stop and get the writer to focus on the traffic signal. Once training has been successfully completed, it will be easier to go faster over time, as the program learns the user's style.

How Different Writers use SpeakQ

Different writers will use SpeakQ differently, based on their abilities and needs. There are two general modes that writers will use: Speak and Select or Speak Continuously.

Speak and Select: Options/Prediction/Speak and Select

'Speak and Select' processes all recognized speech through the word prediction. This provides a writer with less than perfect speech to confirm each spoken word. This can be helpful when a writer says a word like "phrases" and the word prediction presents the following list of options:

- 1 freezes (Meaning it strongly believes the writer said this.)
- 2 friezes
- 3 freeze's
- 4 phrases
- 5 freezer

While 'phrases' isn't first, it is available and they can get back to writing by selecting it. It is also possible to give the program clues as to what word the writer wants. Type the first letter of the word, and then say it. For example: the writer wants the word "beneficial" but SpeakQ isn't recognizing it. Perhaps when they say it the b is too soft, and it sounds like "an official". If they type "b" and then say "beneficial" (which will sound like 'an official', SpeakQ will filter all words that start with "b" and sound like that: landing on beneficial. This technique is very useful with people that have dysarthria, and other speech impediments.

Plus, since Speak and Select is for more intermittent use of words, it requires less mental planning. As a result, younger writers generally have better results with Speak and Select.



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For writers who are getting very high levels of accuracy and are nearly always choosing the first option from the prediction box may want to try Speak Continuously.

Speak Continuously: Options/Prediction/Speak Continuously

'Speak Continuously' has the benefit of getting the words on the screen much faster. It can be seamless and easy with practice. Operation is very similar to more advanced dictation tools, but there are no voice commands or complicated steps to remember. SpeakQ simply selects the first possibility of what it heard. This mode can be very helpful for jotting down ideas, brainstorming and building quick frame works and outlines for writing. Speak Continuously mode is also useful for filling out forms and templates.

It should be noted that for 'Speak Continuously' mode to be practical it requires very high levels of dictation skill from the writer. The speaker will need to be able to dictate in clear, controlled and fluent phrases or sentences. Mastering these skills can come over time, with practice, while using SpeakQ's 'speak and select' mode. Of course, the environment will also need to be quiet and controlled. A high quality microphone will be a must, and the computer will need to be well trained to the writer's voice. Otherwise, the writer will spend more time fixing ill recognized speech, than actually writing. Compared with Speak and Select, this mode is generally much more intolerant of accents, imperfect speech and challenging background noise.

Consider, also, that dictating requires a lot of mental planning. Writers need to know what they want to say before they say it, so they may concentrate on making sure their words are easily recognizable when spoken. Younger writers and writers that need to think their ideas through are advised to use 'Speak and Select' mode. Thinking, while speaking, makes for choppy dictation, which won't be tolerated in 'Speak Continuously' mode. "Um" and similar words will be heard, and will affect accuracy. SpeakQ will not auto-correct unnecessary interjections, and may recognize words that are different than the speaker's intention. Writers will also need to verbally say the punctuation they want, or be prepared to fix it later. Refer to the WordQ transcript which will this kind of proofreading.

Many people think of SpeakQ as a stepping-stone to more challenging speech recognition programs. A writer can start by using SpeakQ intermittently and dictate more as they get better at it. When writers start having a lot of success in 'Speak Continuously' mode, they are likely ready to consider the benefits of a more challenging program.